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meccano magazine

April

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the practical boy's hobbies magazine

IN THIS ISSUE

- Powerboat radio control
- Meccano model-building competition
- 50 FREE Dinky Toys to be won
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1966

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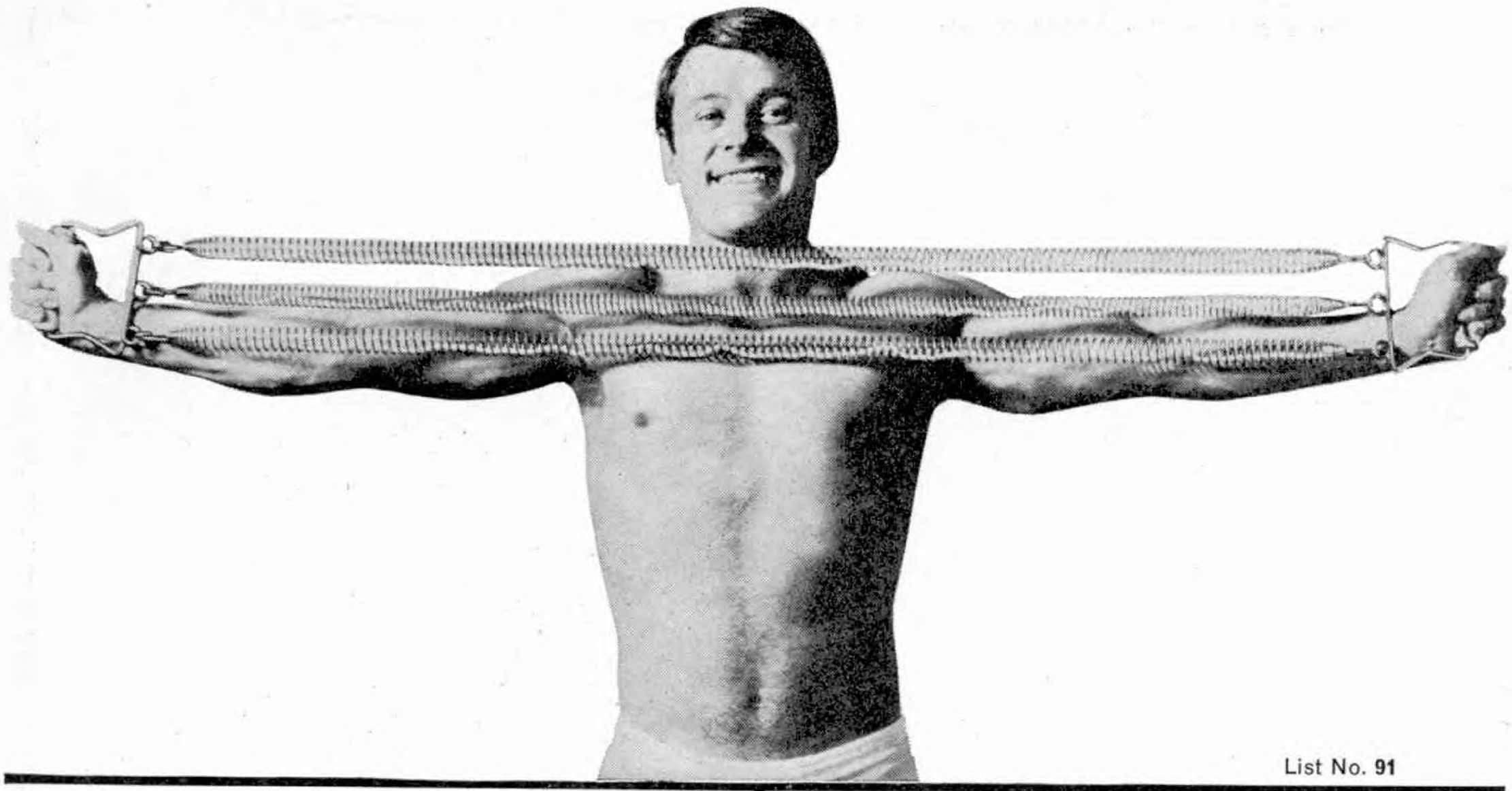
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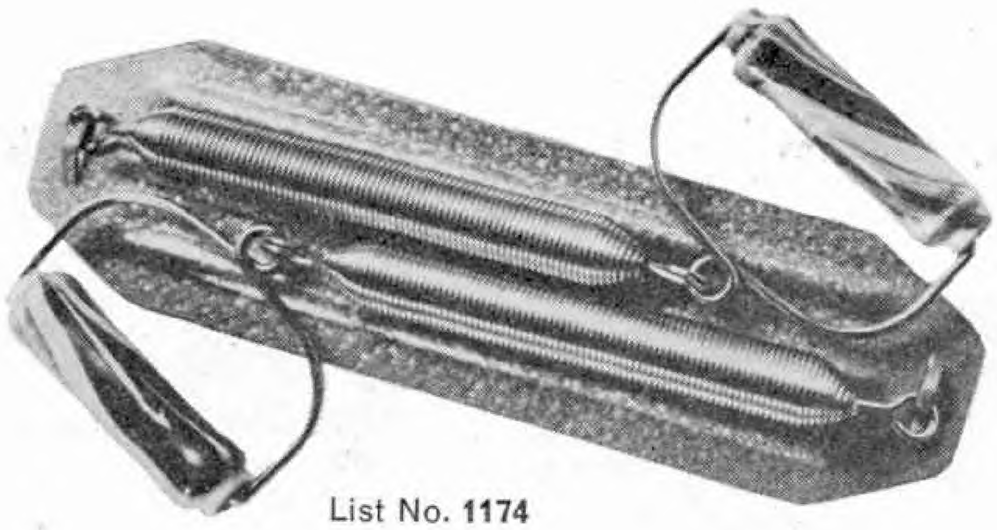
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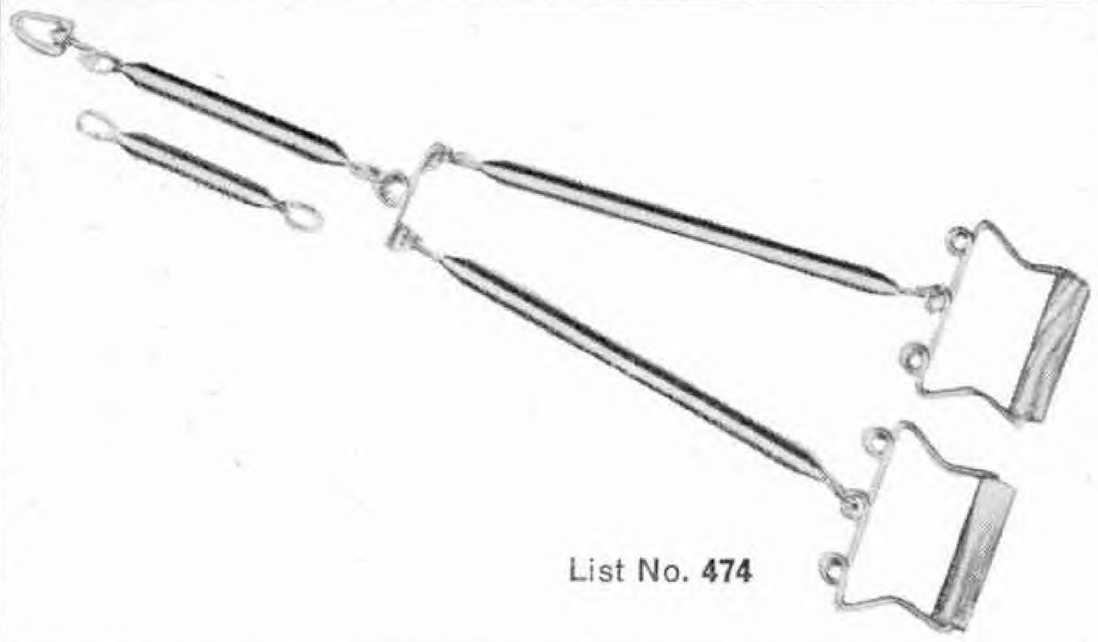




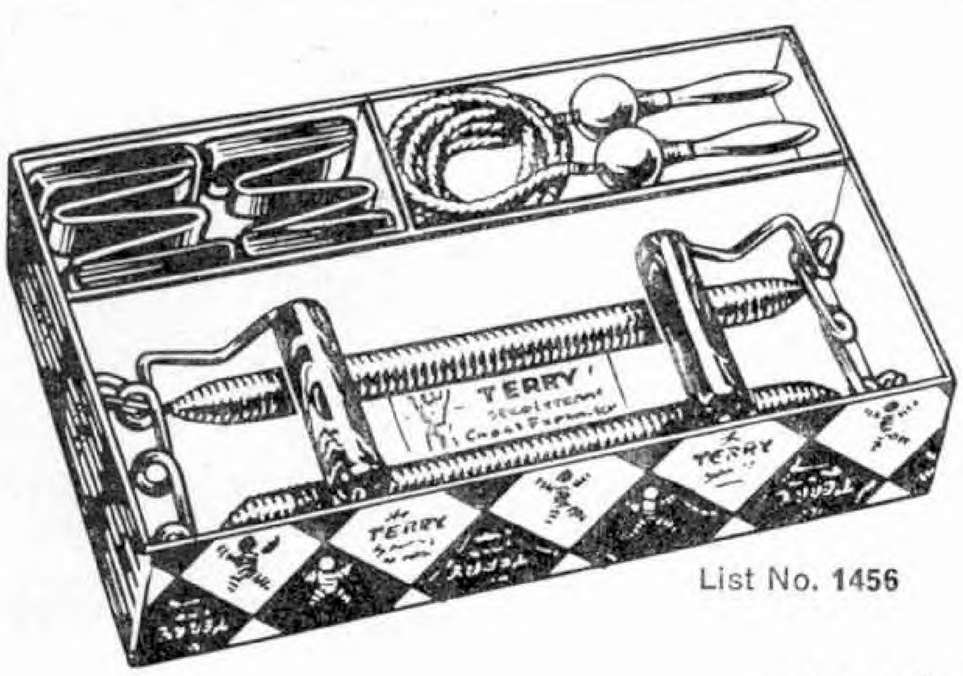
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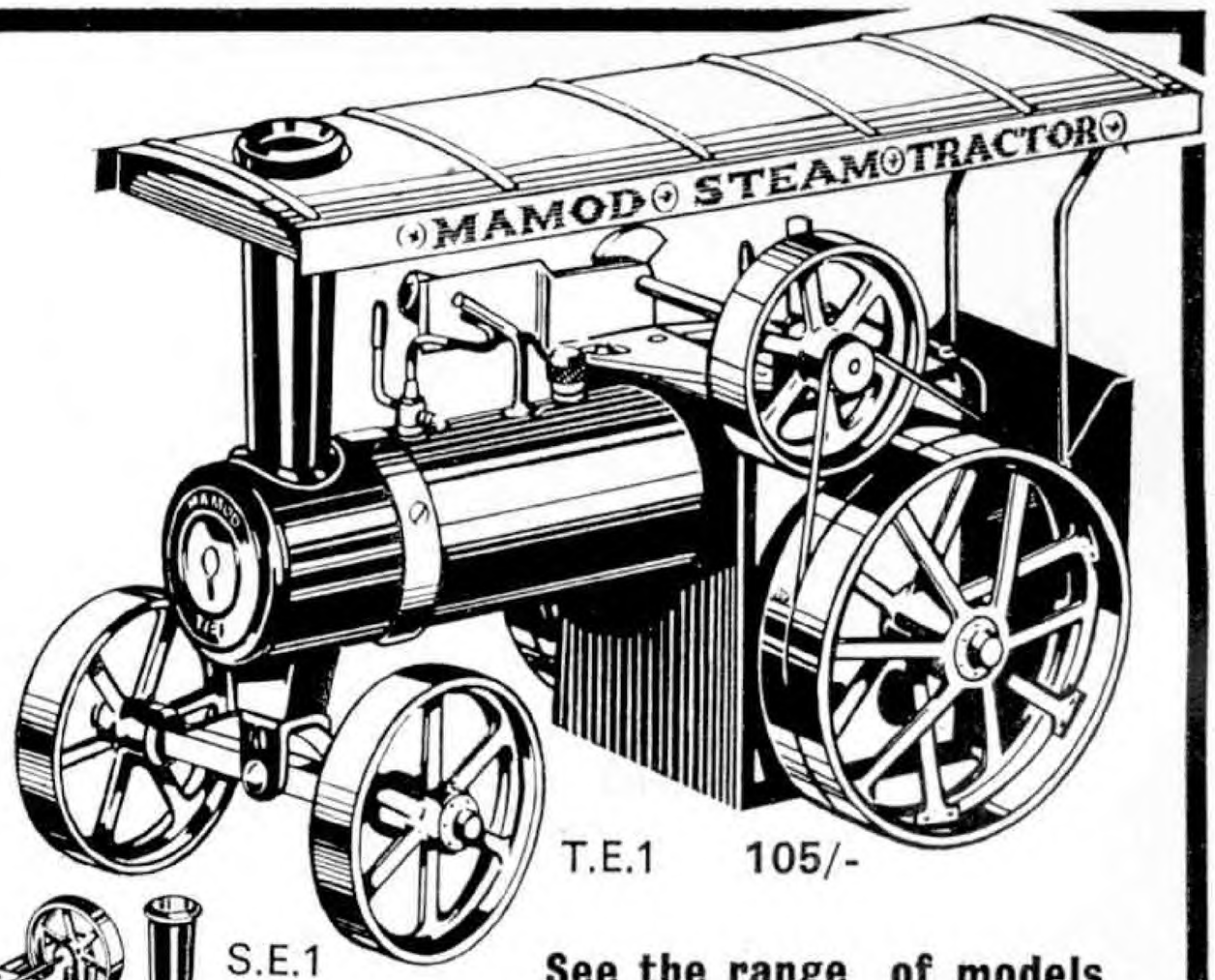
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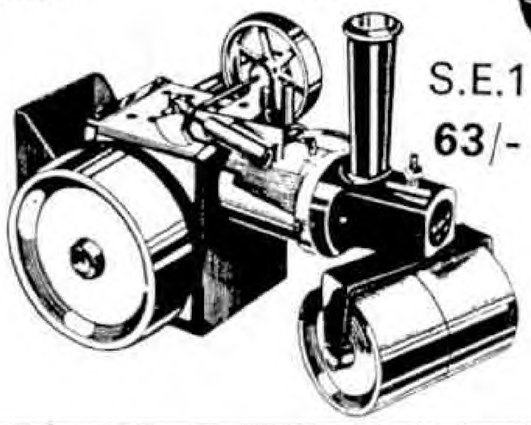
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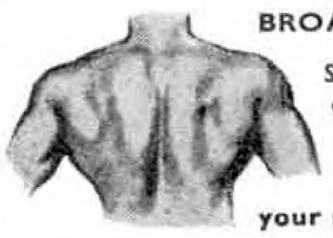
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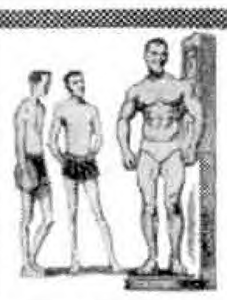
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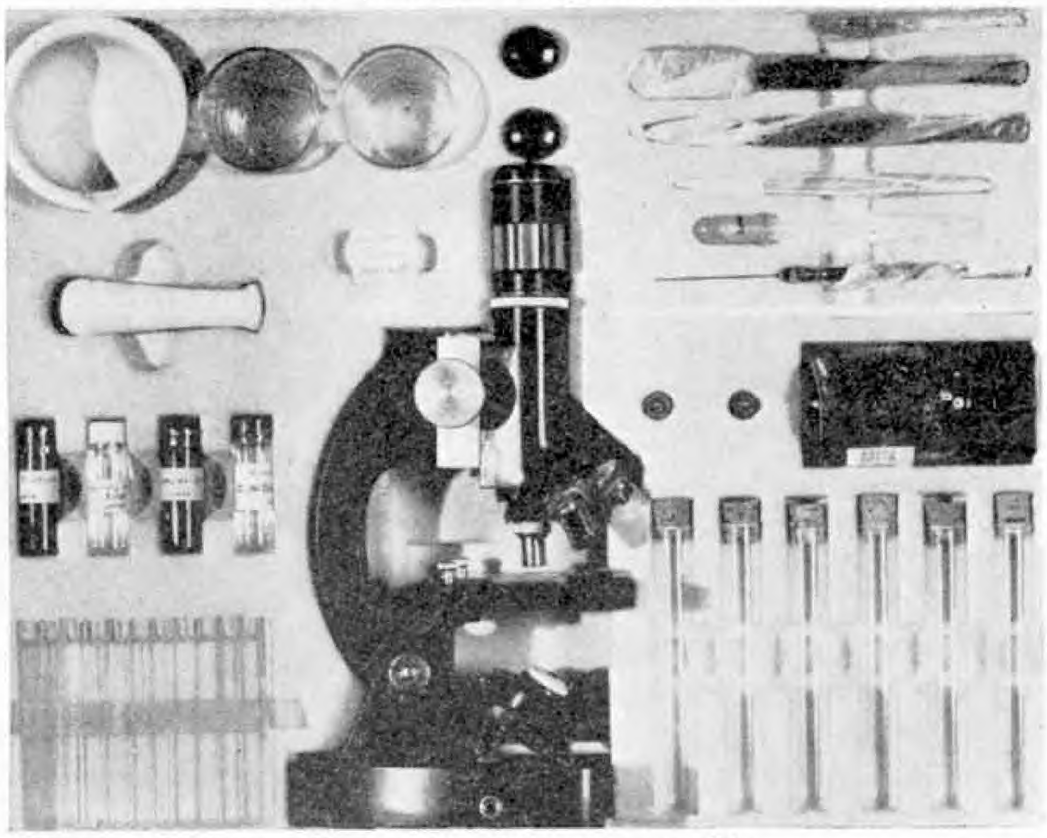
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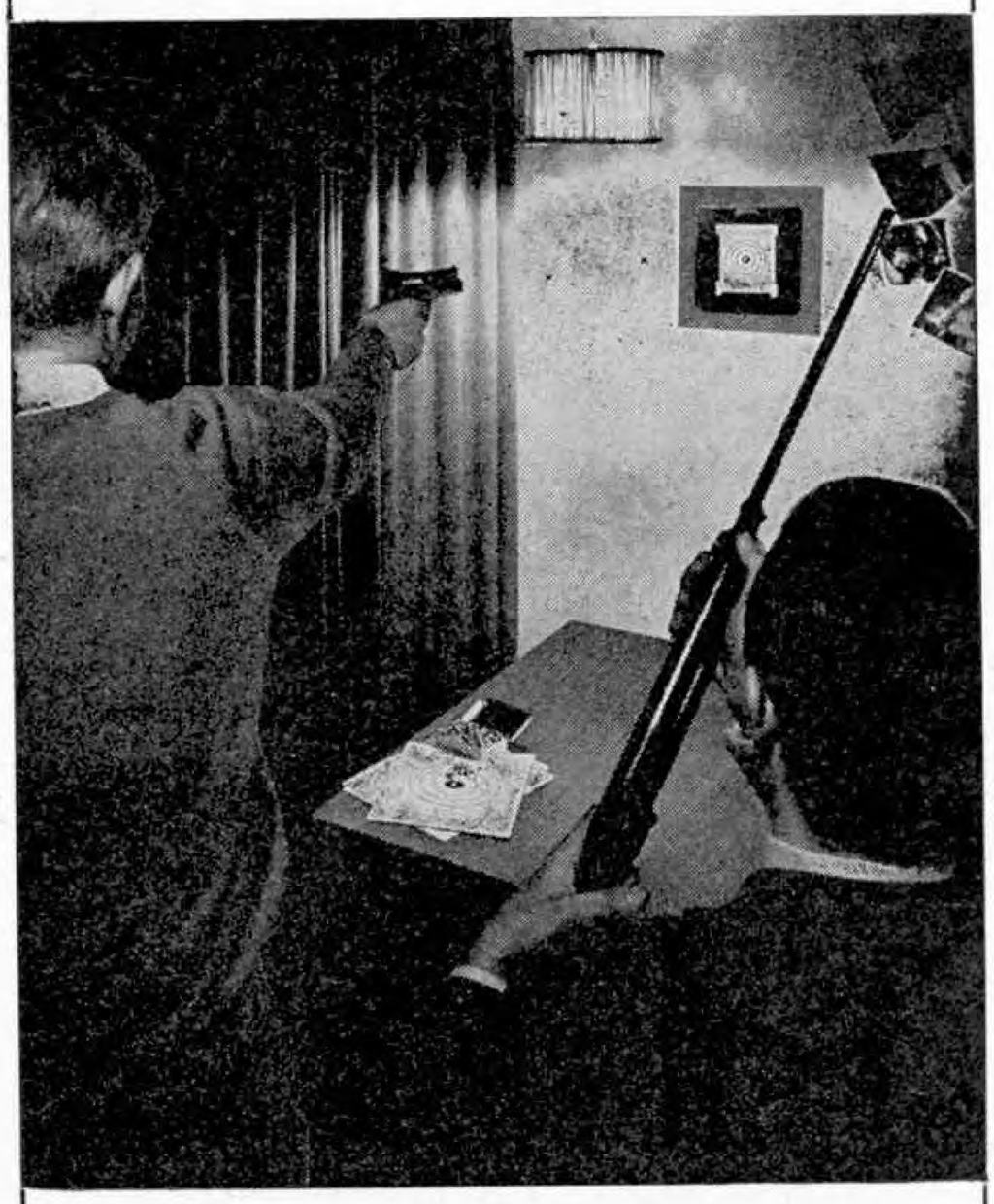
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meccano magazine

the practical boy's

hobbies magazine

April 1966 · Vol. 51 · No. 4 · Monthly

AEROMODELLING □ RADIO □ ELECTRONICS □ CAMPING □ CYCLING □ STAMPS □ FISHING



Our cover picture has a real 'space-age look' about it. The Nippon Airways Boeing 727 is being given its essential pre-delivery checks at its maker's airfield—Renton. Read about this highly successful airliner on page 18

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Throughout our half-century of publication, competitions have been a regular feature of Meccano Magazine Contents, and the annual event to which many Meccano builders look forward is, of course their own Model Building Competition.

By tradition, this competition has usually been launched in the January issue, and some of you have been writing to me to ask whether, since it did not appear in our first 1966 number, we had discontinued the feature.

One or two writers were, in fact, quite appalled at the possibility of the demise of their annual challenge ! Well, as you will see by turning to page 29, their fears are groundless, and I look forward to being quite swamped with your entries.

Talking of old-established institutions, a reader recently asked me, who was our oldest contributor ? What he meant, of course, was who had been contributing longest to Meccano Magazine !

Well, that one's easy, John W. R. Taylor is our unchallenged oldest inhabitant having started his 'Aviation Feature' way back in 1943. John and his favourite subject—aeroplanes—have both come a long way since those far-off wartime days. He is now, as many of you will know the Editor of 'Jane's All The World's Aircraft'—acknowledged by everyone in aviation to be the world's most authoritative annual reference book on matters aeronautical.

Jet airliners, about which John writes in this months issue, were unheard of in 1943, and the jet engine itself was a rather unpredictable piece of engineering. Even the fastest fighters of the day were much slower than today's airliners, and the top speed of the airliners of twenty-three years ago was often little in excess of the landing speeds of today's giants.

Who would like to guess at what aeroplanes will look like in another twenty years time ? Perhaps there's a subject here for that Meccano Model Building Competition !

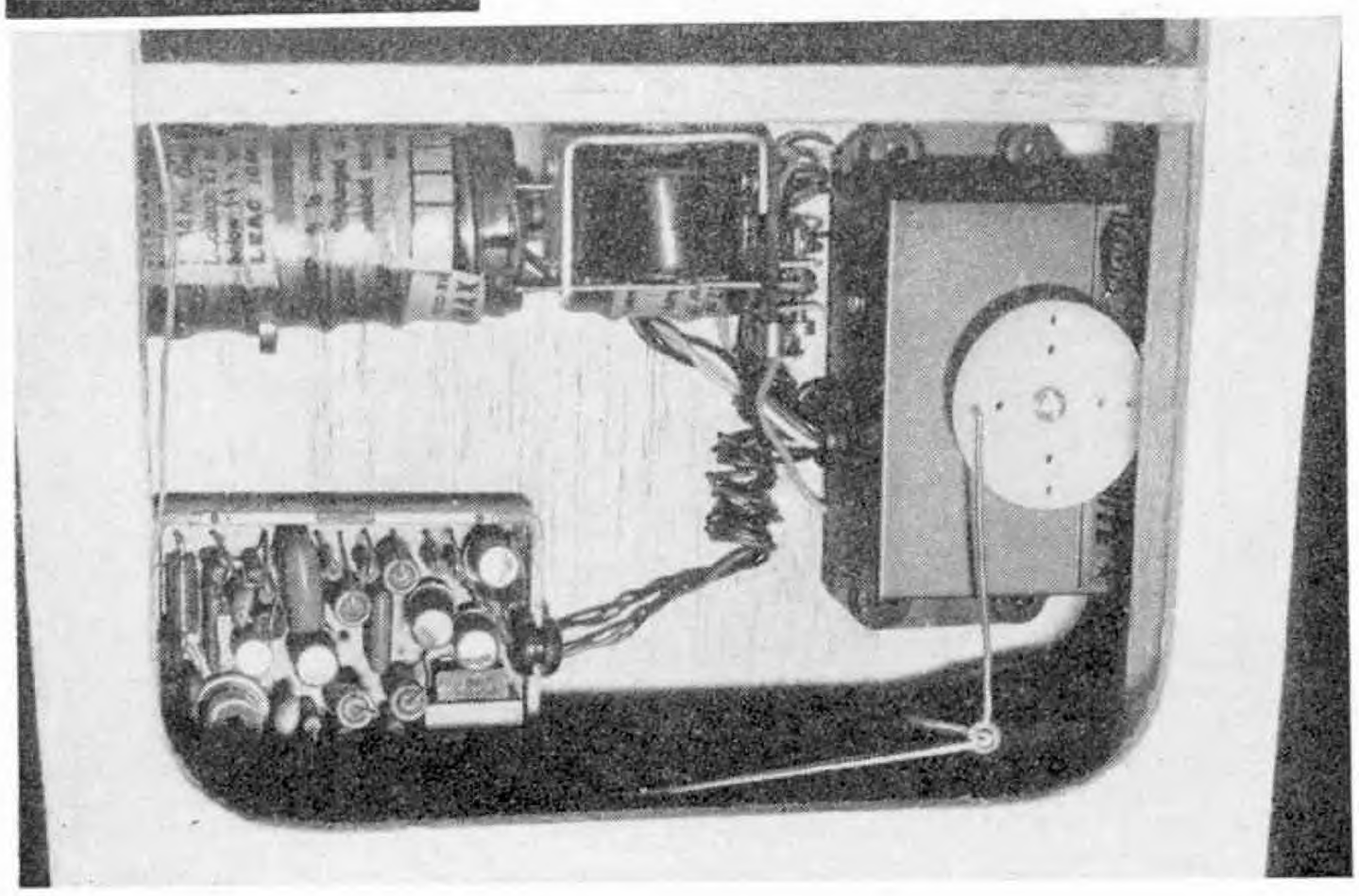
The Editor

next month: there's an exciting feature showing you how to make yourself an electronic metronome. It's fully transistorised and gives variable audible *and* visual signals.

PROJECT 66 ..ADDING RADIO CONTROL

This month, Ron Warring completes his four-part model powerboat series by showing you how to install radio control in any of the eight model powerboats which have been featured in his three earlier articles. Copies of the January, February and March issues with which two free, full size powerboat plans were presented, are obtainable from the back-numbers department, Meccano Magazine, St. Alphage House, Fore Street, London, E.C.2., price 2s. each including postage





Above: A Meccano Magazine reader works on 'Brave Moppie' built from plans in the January issue. Below: Suggested component positions for a single channel installation. Note the slave relay fitted between the batteries and the actuator

WHICHEVER version of' Project 66' you have built, adding radio control is a logical step for getting the most satisfaction from your model. This is, of course, an expensive addition—but it need not be *too* expensive. If you are prepared to build the transmitter and receiver from prefabricated kits you can complete these for about £8-£10—and once made they can be used for other radio controlled models as well, of course. The same applies to ready-made radio equipment, although this will cost anything from about £14 upwards for the transmitter-receiver combination.

On top of this you will also need an actuator (which must be bought as a ready-made item), plus batteries. There is, unfortunately, no cheap way of obtaining reliable radio control—but the extra satisfaction you can get out of a radio controlled model is well worth it.

The simplest—and cheapest—form of radio control is *single channel*. This means a transmitter-receiver combination capable of giving a *single* 'on-off' signal, which is turned into 'muscle power' by the actuator in the form of a *sequence* movement. That is to say, if the actuator is used to move the rudder, *one* signal from the transmitter will move the rudder to the right and the *next* signal will move it to the left. With *no* signal, the actuator returns to neutral and centralises the rudder.

You just have to remember which rudder position was signalled last as the next signal given will produce opposite rudder movement. The modern actuator, however, does simplify this system by working on the principle that *one* signal from the transmitter, held on, gives one rudder position (say, right rudder), whilst a 'double signal' always gives the opposite rudder position. As far as making the actual signals are concerned, this means that 'press and hold' on the transmitter button always gives, say, right rudder. 'Press-release-press and hold' always gives left rudder.

The actuator may also be a 'compound' type which gives a third 'selective' signalling position — either a quick blip on the transmitter button, or 'press-release-press-release, press and hold'. This can be used to operate *another* actuator providing the power to operate another control (usually engine speed).

The choice

The alternative system is 'multi-channel' where the transmitter can produce two (or more) separate signals, each of which operates a specific control. Normally *two* channels are used to operate *one* particular control. Thus a two-channel system would be used to operate rudder only. Movement of the transmitter key one way will *always* produce right rudder; and movement of the key the other way will *always* produce left rudder. As with the single-channel system, the actuator automatically returns the rudder to neutral once the transmitter signal is released. Further

services, such as engine speed control, need additional channels to operate.

Multi-channel is a much better system for working, and gives a better form of control, but it will cost considerably more than single channel. Even a two-channel radio will cost more than twice single channel and still only give rudder control. It is worth going into, however, if you can afford it.

A lot will also depend on how much control you *need*. With an electric-powered model which is not capable of reaching high speeds, normal single-channel radio is quite adequate for steering (rudder control)—Fig. 1. You can also use the 'third' position on a compound actuator to operate a motor switching control via a 'changeover' or three-position non-neutralising secondary actuator. This can provide two or more switching positions for the *motor* circuit, arrived at in *sequence*. Thus a two-position secondary actuator could give motor 'on-off-on . . .' A four-position secondary actuator could give motor 'forward-stop-reverse-stop-forward', etc., in sequence (Fig. 2). Note: This diagram shows 'mechanical' switching of the main motor circuit. Some secondary actuators incorporate switching contacts in the actuator itself and so the wiring can be made direct to the motor contacts instead of using the actuator to drive an external switch. Either method — just rudder only or rudder plus motor switching—is a practical system with single-channel for an electric powered boat. It would need three channels of 'multi' to perform the same functions (two for rudder and the third for sequence switching of motor).

Diesel Power

With a diesel powered boat using engines up to 1·5 c.c. throttle controls are comparatively rare. We need, therefore, only consider rudder control, unless the motor used has got a throttle. In this case it can be operated via a 'change-over' type secondary actuator off a 'compound' main actuator in the case of single-channel; or from the third or third and fourth channels with multi-channel control (the first two channels being used for steering). Since the diesel powered boat will be fast, multi-channel control for rudder will be better than single channel, but we can still get by quite all right with single-channel if we do not want to go to the extra expense. With single-channel, however, we would recommend forgetting about any form of engine throttle control.

As regards the actuator, a *motorised* type is recommended (and essential with multi-channel operation anyway) as being simpler to install and providing all the power necessary to move the rudder. Aircraft-type escapements are not suitable for this job.

For our model we have chosen the 'Minimac' single-channel receiver and the RMK 'Dynamik' single-channel motorised actuator as thoroughly reliable

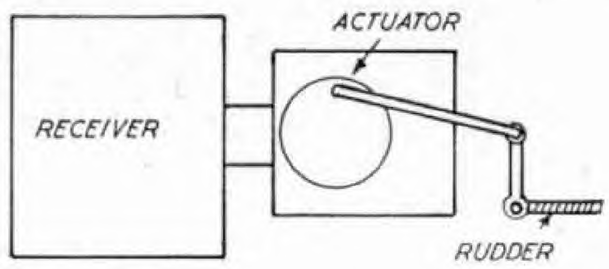
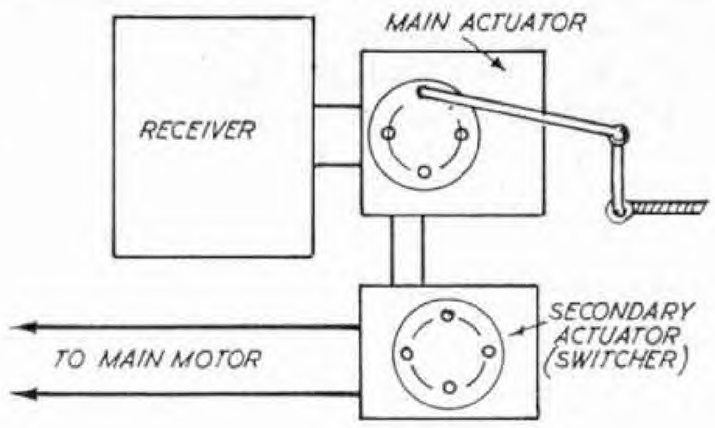


FIG.1



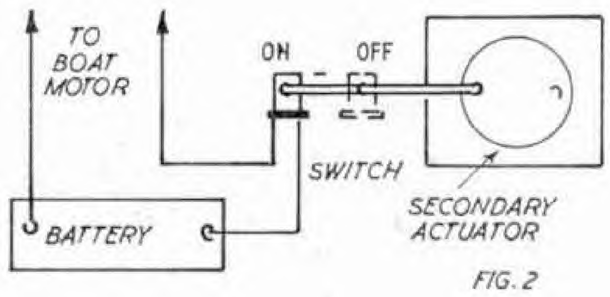
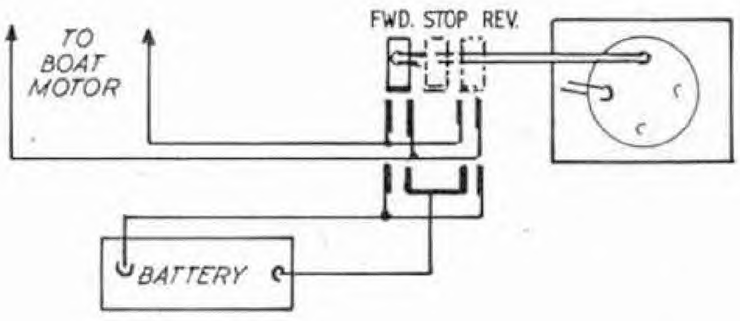


FIG.2



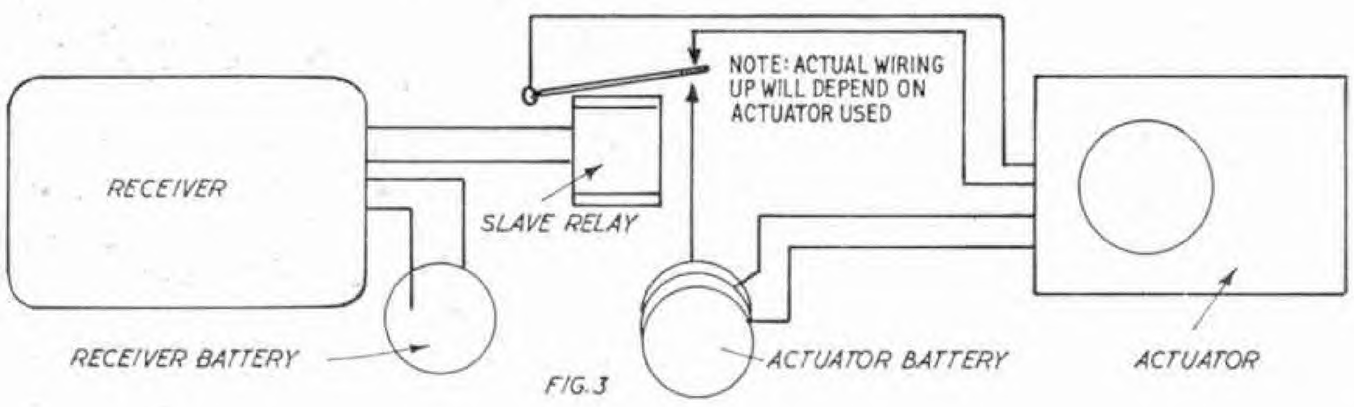


FIG.3

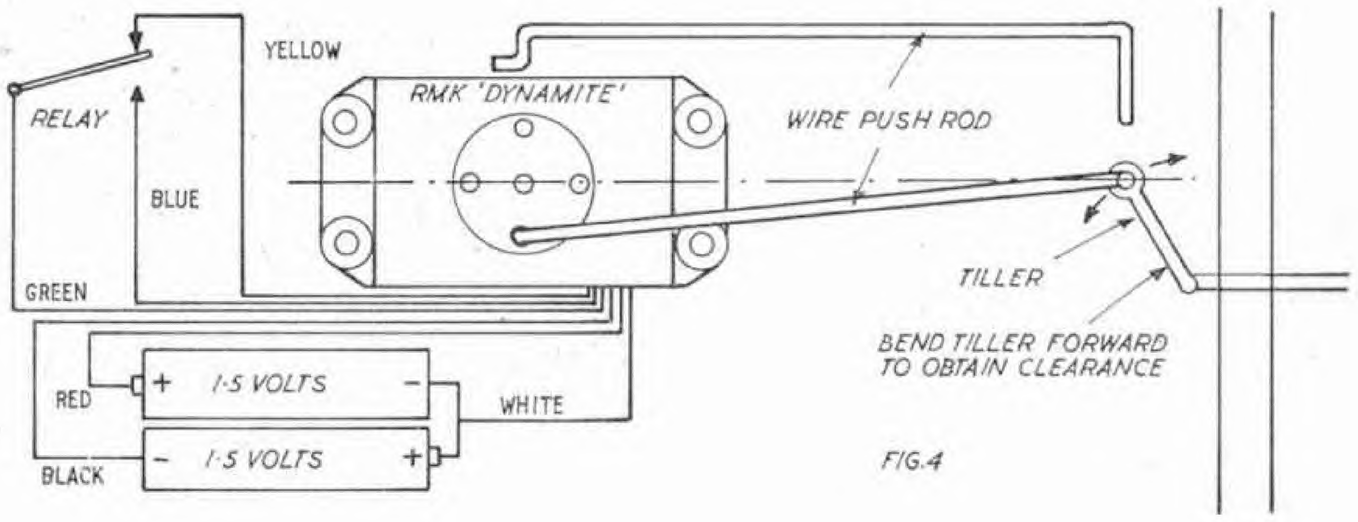


FIG.4

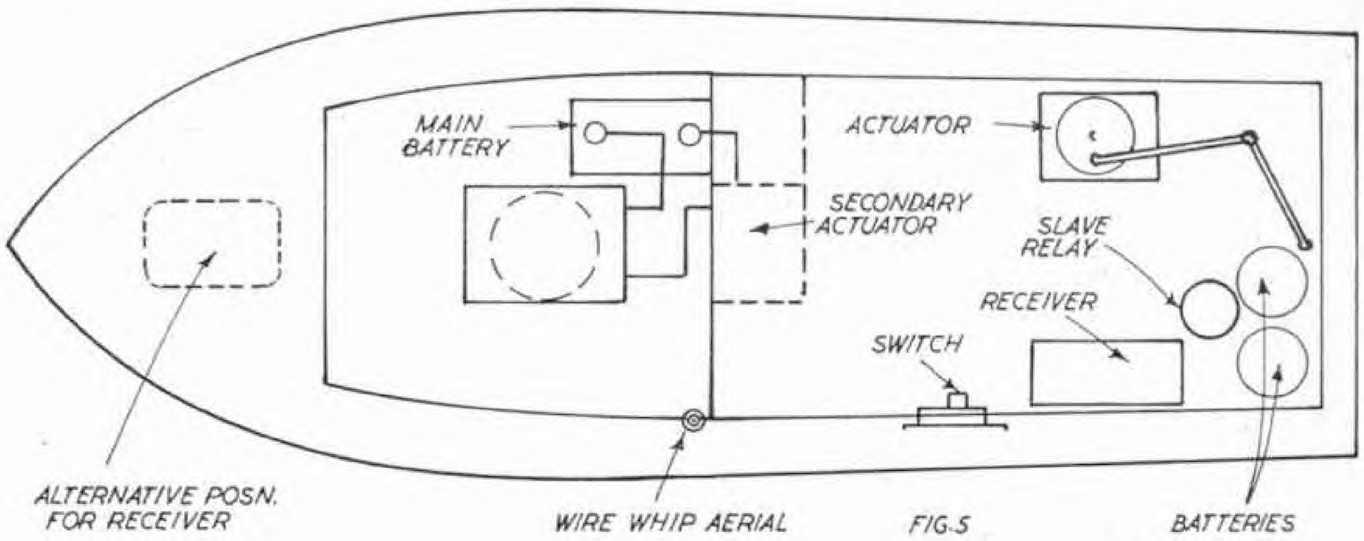


FIG.5

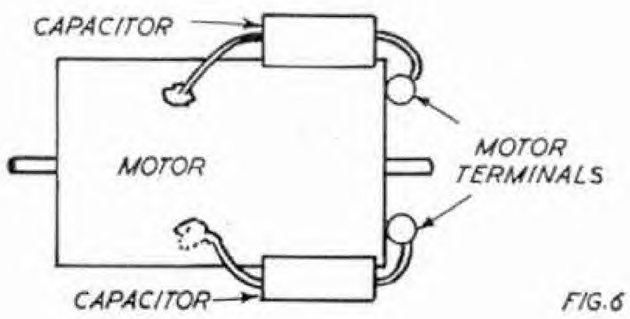
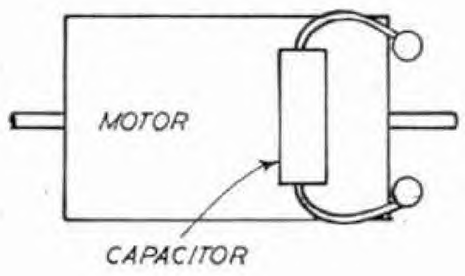


FIG.6



and first class equipment, although other types of single channel receivers and motorised actuators can be used if preferred.

Component Location

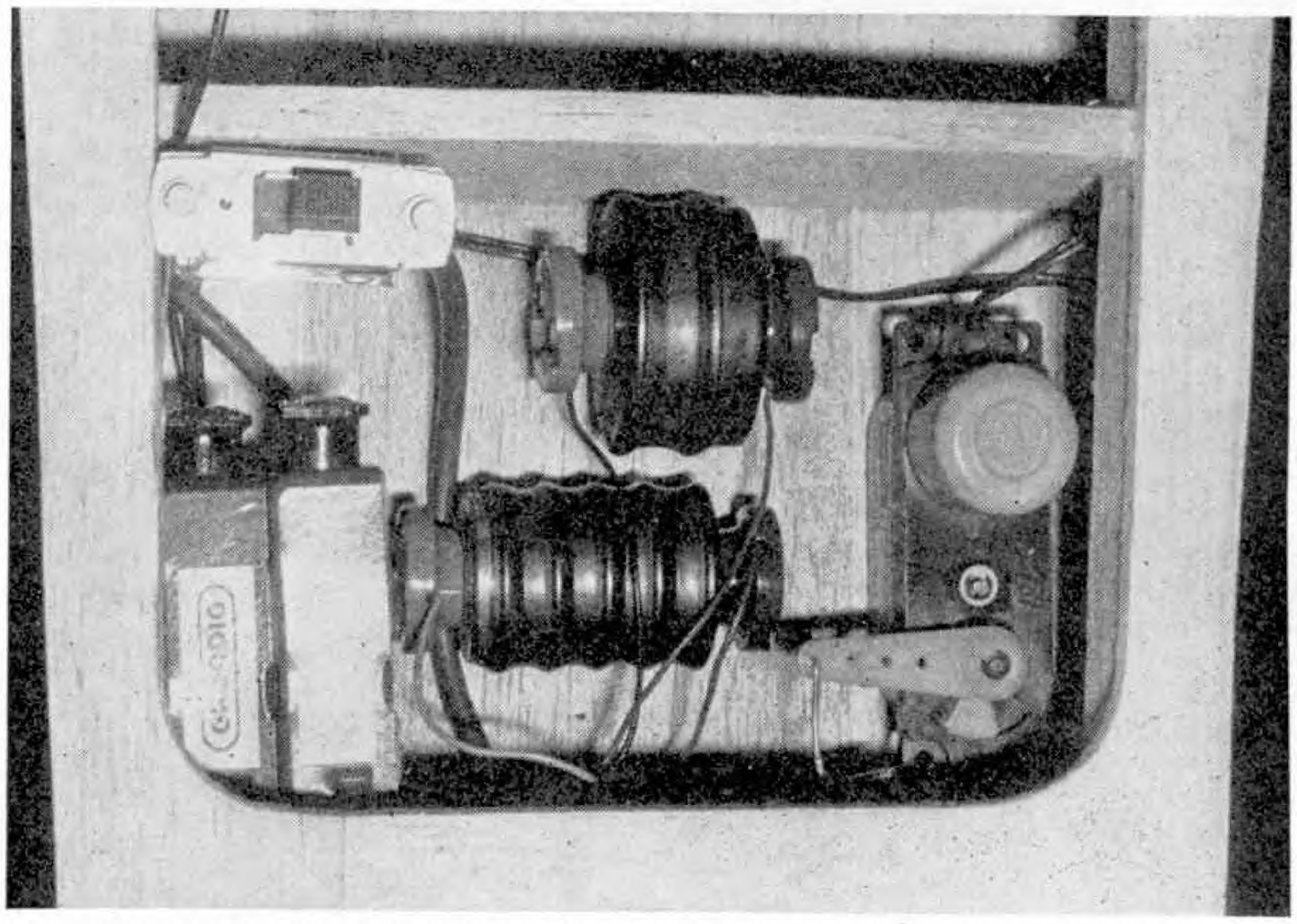
The 'Minimac' receiver is a relayless type which normally connects direct to an actuator. This is not a particularly satisfactory arrangement with a motorised actuator, however, and so the receiver is connected to a *slave relay* which in turn acts as a switch for the motorised actuator circuit—Fig. 3. This completely separates the receiver and actuator circuits, each of which have their own separate battery, and makes for fully reliable operation. A similar system is recommended whatever type of *relayless* receiver is used, the slave relay being of about 20 ohms coil resistance. A suitable type is the Ripmax T.40. Relay receivers already have a relay incorporated for switching and so the slave relay can be eliminated in such cases. The actual wiring connections required for the actuator used must be exactly as specified in their instructions, however.

Installation should present no problems at all, the wiring up following the diagram of Fig. 3 (or Fig. 4 using the RMK 'Dynamite' servo). The mechanical hook-up is even simpler since it is only necessary to connect the output disc of the actuator to the tiller arm with a simple wire linkage, as shown in Fig. 4. For a better 'engineering' job use an adjustable linkage, such as the Graupner set. This enables the neutral position of the rudder to be adjusted, as necessary. With a simple wire linkage, adjustment can be made by bending the tiller arm.

This leaves the question of where to place the various components. Logically, the actuator should be placed fairly close to the tiller and the receiver as far away from the actuator as possible to minimise the risk of interference. At the same time, the receiver also wants to be as far away from the boat motor in the case of electric power, also to avoid interference; and remote from the engine and fuel tank with a diesel powered model to avoid getting smothered in fuel.

About the ideal position would be to stuff the receiver right up in the bows, sealed off in a watertight compartment, in which case the aerial should be mounted behind it on the deck or forward part of the cabin roof. However, a more practical installation is to group actuator and receiver in the cockpit area aft of bulkhead 5 position—see Fig. 5—with the aerial in a more or less 'scale' position amidships. The aerial is a vertical piece of 20 s.w.g. wire which should be at least 20 in. long.

With all the radio components and batteries mounted in the cockpit area some protection is really needed against spray, etc., in the case of open-cockpit versions. The neatest arrangement is usually to box-in with balsa sheet. Alternatively, the batteries can be 'sunk' through the cockpit floor and actuator and receiver on top of the floor covered over with a false floor. If the receiver is already enclosed in a case this will provide adequate protection; otherwise wrap the receiver up in a small polythene bag with the neck sealed with a rubber band where the wiring emerges. Avoid taking the aerial wire from the receiver out in a bunch with the other wires.



Above: Suggested positions for Grundig two channel radio equipment which just plugs together—there's no soldering. The DEAC battery-packs would need balsa boxes.built for them, but as you can see, there's plenty of room to spare!

Hints and tips

Before finally deciding on positions for the actuator, receiver and batteries, lay in position and check that the *balance* of the boat is satisfactory when afloat. If not, adjust the positions as necessary until the hull trims level and slightly bow up. Then 'fix' the components. The actuator needs to be firmly secured. Receiver and batteries can simply locate in a tray or box of balsa. Deacs are recommended both for the receiver and actuator batteries as being compact, extremely reliable and rechargeable. Move the main motor battery into the engine compartment in the case of an electric powered model to avoid possible interference from motor wiring adjacent to the receiver.

The main boat motor will also need to be suppressed, one of the most effective methods being to solder two suppressor condensers (0·01 microfarad) from each motor terminal to the motor casing as shown in Fig. 6. If the motor casing is not metal, then a single suppressor condenser can be used connected directly across the motor terminals.

A more or less similar layout can be used for multi-channel installations. If a secondary actuator is used for motor control (e.g. operated off a compound actuator in the case of single channel; or off one or two further channels with 'multi'), this should be located immediately behind bulkhead 4 on the cockpit floor, where it can be covered in with a balsa box. This simplifies wiring to the electric motor—Fig. 5.

Finally, here are some important points to check or remember in connection with radio controlled boats.

(i) The most common cause of 'radio failure' is flat batteries, so always make sure that the receiver and actuator batteries are fresh or fully charged. This applies to the transmitter batteries, too. Deacs are recommended for maximum reliability. If you use dry cells, buy the 'high energy' type.

(ii) The receiver can only be correctly tuned to the transmitter *with the boat in the water*. The actual setting may be quite different to that established by tuning out of the water.

(iii) Never leave the receiver or batteries in the model when not in use. Remove them and keep the receiver in a dry atmosphere.

(iv) Never leave a radio controlled boat in a damp place as this can cause deterioration of the actuator and motor.

(v) If for any reason the radio installation gets swamped with water, remove receiver and actuator from the model and dry out carefully, but not by heating.

(vi) Make sure that the aerial wire is not 'earthed out' by coming into contact with a damp part of the deck or cabin sides.

(vii) Make sure that you are not touching the aerial, or the aerial is not touching anything else, when tuning the receiver.



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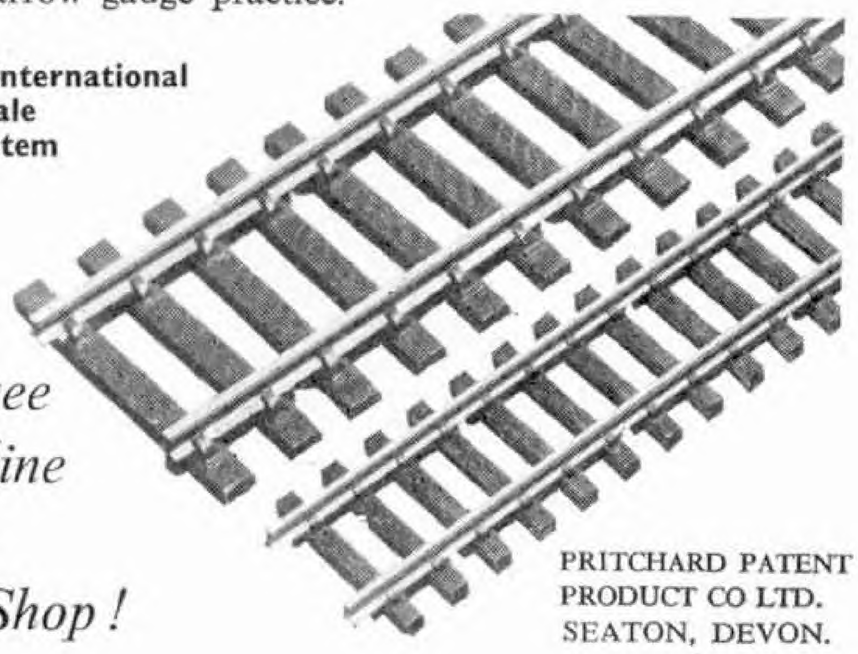
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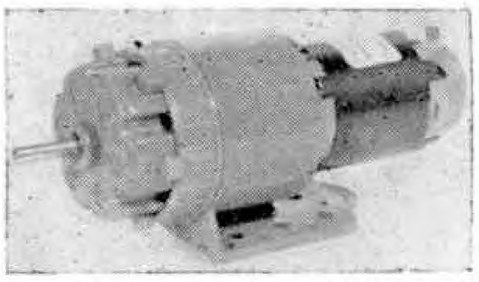
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Mike Rickett

the 'bluebell' thrives in sussex

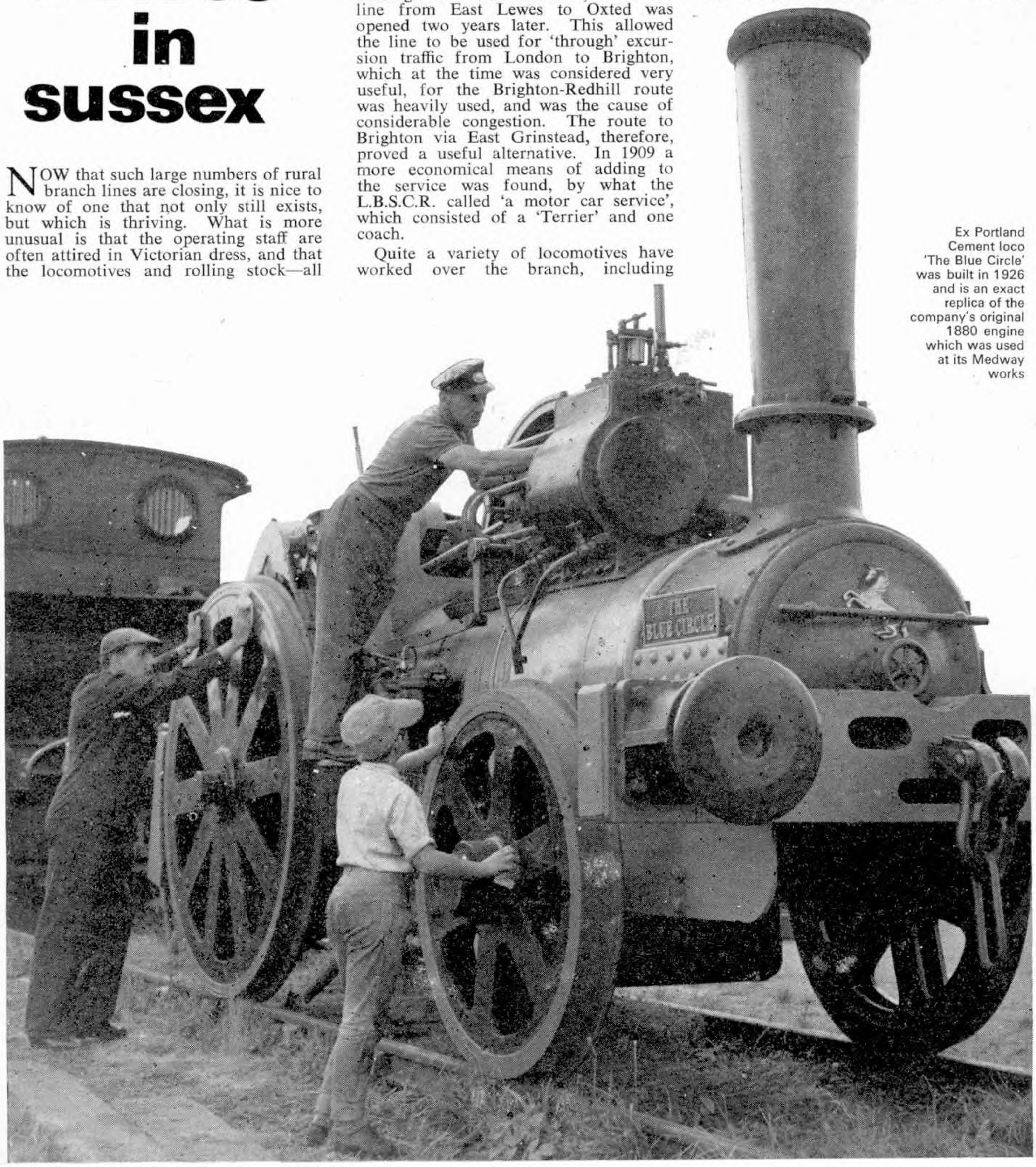
NOW that such large numbers of rural branch lines are closing, it is nice to know of one that not only still exists, but which is thriving. What is more unusual is that the operating staff are often attired in Victorian dress, and that the locomotives and rolling stock—all types that are elsewhere long extinct—are painted in the colourful liveries that were once an everyday scene on any British railway.

Surprisingly the Bluebell railway runs only a few miles from London, right in the heart of the Sussex Weald, forming part of the sixteen mile route between Lewes and East Grinstead. The name 'Bluebell' properly applies only to the eleven mile stretch of single track line between Culver Junction north of Lewes, and Horsted Keynes, while the title 'Primrose Line' refers to the six and a quarter mile line between there and East Grinstead.

On the opening of the line in 1882, a rather poor service of only five trains a day in each direction was provided, although this was added to, when the line from East Lewes to Oxted was opened two years later. This allowed the line to be used for 'through' excursion traffic from London to Brighton, which at the time was considered very useful, for the Brighton-Redhill route was heavily used, and was the cause of considerable congestion. The route to Brighton via East Grinstead, therefore, proved a useful alternative. In 1909 a more economical means of adding to the service was found, by what the L.B.S.C.R. called 'a motor car service', which consisted of a 'Terrier' and one coach.

Quite a variety of locomotives have worked over the branch, including Adams' 4-4-2 tanks and Marsh Atlantics, which were normally used on the London through trains. Freight traffic was often operated by a 'Vulcan' 0-6-0 or a 'radial' 0-6-2T, although latterly the B.R. 2-6-4T had taken over most of the services.

It was arranged for the line to be officially closed on June 13, 1955, although a footplatemans' strike resulted in the last train running on May 28. Many objections to the closure were lodged, and protest meetings were held, but neither had any effect, and the line closed on the arranged date. A local citizen, however, discovered a flaw in the closure, in that according to the original Act of Parliament, the line could only be closed by government authority, and not by independent action of the railway.



Ex Portland Cement loco 'The Blue Circle' was built in 1926 and is an exact replica of the company's original 1880 engine which was used at its Medway works

The line was subsequently re-opened on August 7, 1956, with the minimum service of four trains each way daily, as specified in the Act.

The line once again became a candidate for closure, and on this occasion received considerable publicity on radio, television, and in the national and local press. The last train, which ran on March 16, 1958, was filled to capacity with well wishers and enthusiasts. A nine coach train had to be used, and this was appropriately pulled by B.R. 2-6-4T No. 80154, the last steam locomotive to be built at Brighton works. Under the closure proposals the single track section from Culver Junction to Horsted Keynes was to be abandoned, and the double track line from there to East Grinstead retained.

At a public meeting held at Haywards Heath in March 1959 the idea of a preservation scheme was put forward, resulting in an approach being made to the Southern Region. The idea was not at first taken seriously by them, but eventually the line was offered for £34,000. By June 1959 the Bluebell Railway Society was constituted and in December of that year they were successful in negotiating a lease, with the option of buying the line for the agreed sum at any time.

The Society also applied for a Light Railway Order to allow them to operate the line, and this was granted in July 1960. On May 17 of that year, the first locomotive was obtained—ex L.B.S.C.R. No. 55 'Terrier' 0-6-0T which steamed into Horsted Keynes with two L.S.W.R. coaches. A second locomotive was, however, required for the other end of the train because of the lack of a crossover at Horsted Keynes, and for this purpose former S.E.C.R. 'P' class 0-6-0T of 1909 vintage arrived on June 17.

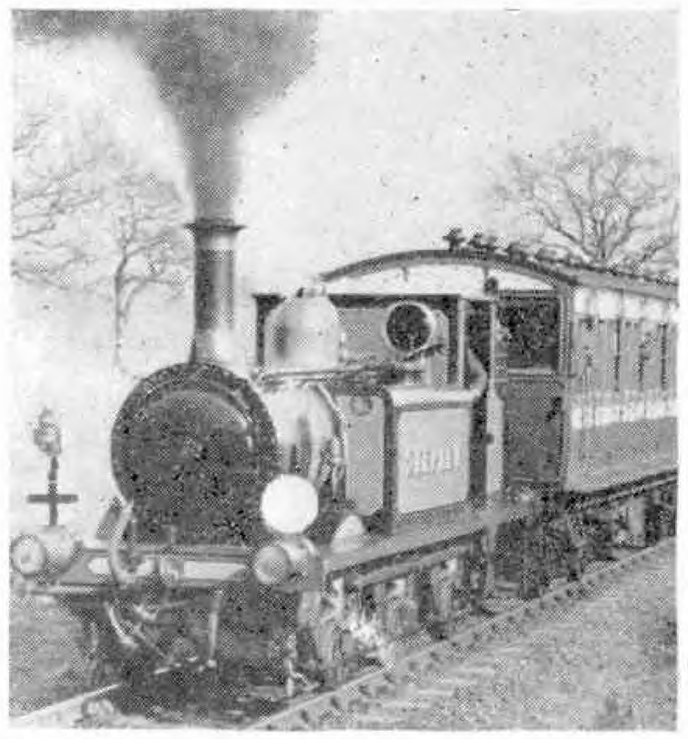
'Primrose' arrives

For the formal opening on July 9 the operating staff were all dressed in Victorian style, and the guests, many of whom were also dressed in period costumes, included two ladies who had witnessed the opening of the line 78 years before. The Brighton 'Terrier' had its original name of 'Stepney' painted on its tank sides, and the 'P' class tank had been christened 'Bluebell'. Press and television were present, and the two termini of the line must indeed have been reminiscent of the graceful Victorian days. The season that followed saw a total number of 15,000 passengers, among them the then Prime Minister and Lady Dorothy Macmillan.

Efforts were directed towards securing a second 'Terrier' locomotive to act as a spare engine. This did not unfortunately materialise since the S.R. had no intentions of withdrawing any members of the class at that time, and instead a second S.E.C.R. 'P' class locomotive was obtained. No. 31027 arrived in March and was promptly named 'Primrose' in readiness for the new season. In addition four Metropolitan Railway coaches of 1898 vintage from the Chesham branch were acquired. The President of the Society, Bishop Geoffrey Warde, inaugurated the 1961 season, and the first train was double headed out of the station by 'Stepney' and 'Primrose', with 'Bluebell' at the trailing end—a combination that was repeated on many subsequent occasions.



Driver Mr. J. Hart of Surbiton and Porter/Ticket Collector, etc. Brian Thomas of Crawley with 'Primrose'



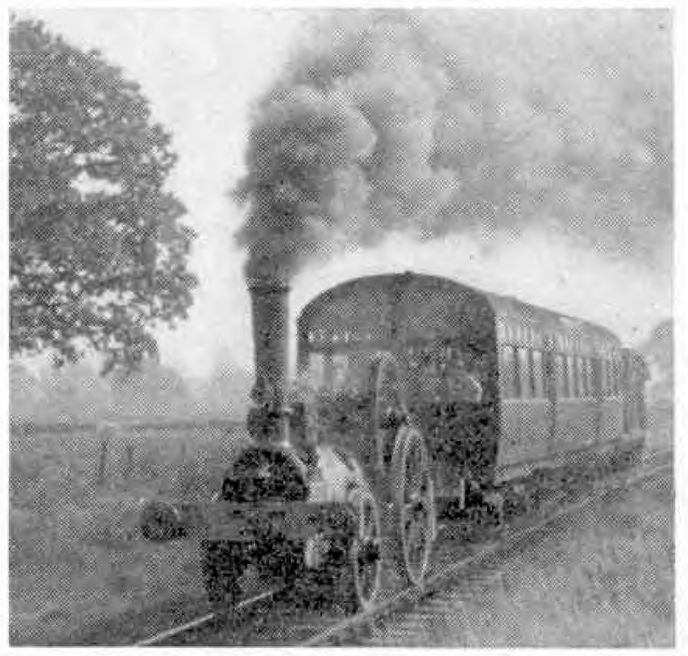
'Stepney' chuffs proudly down the line with the Chesham set resplendent in pre-group livery

The whole beauty of the 'Bluebell' line lies in its ability to re-create the Victorian railway scene. Locomotives are undoubtedly the greatest single asset in achieving this, and every effort was made to locate and save remaining examples of historic locomotive types. A special fund was, therefore, set up for two engines of great historic value. The first of these, an Adams 4-4-2 'Radial' tank No. 488. reached the line in July, and the second, East Kent Railway No. 5, followed. This one had been associated with the Lyme Regis branch for 45 years.

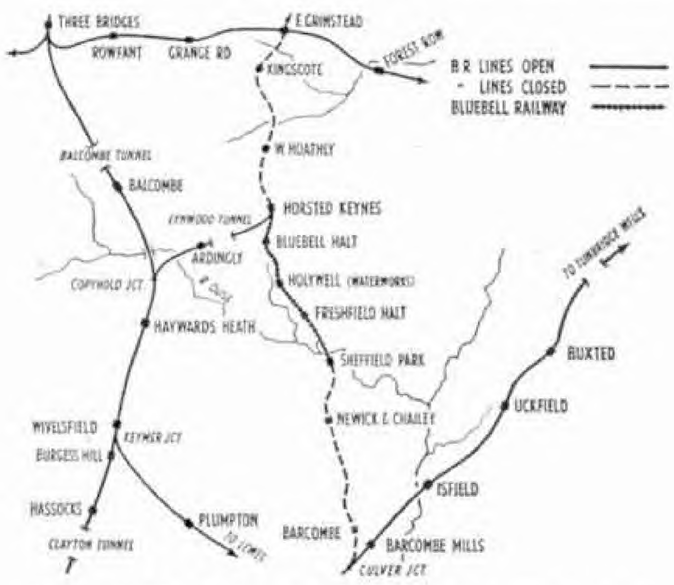
'Stepney' had by now appeared in its final condition — a magnificent restoration job by the staff of the railway. The original L.B.S.C.R. livery was faithfully reproduced, and the locomotive now makes a splendid sight in its Stroudley Yellow livery. Another historic locomotive which arrived at Sheffield Park was North London Railway 0-6-0T No. 76, B.R. No. 58850.

Although the line to Horsted Keynes is now closed, the traffic on the Bluebell line has increased, it now carrying many thousands of passengers every year. The figure had increased to 91,000 journeys in 1961, and is growing larger every year.

Much of the hard work in the restoration of the line is now complete, and the locomotive position is a happy one, with many types that are sole survivors of their classes. These include G.W.R. 'Dukedog', 'Earl of Berkeley' 4-4-0,



The glass-fronted observation coach provides passengers with a fine view of the line ahead and the whirling flywheel of 'The Blue Circle'



(Note : the BR line from Haywards Heath to Horsted Keynes is now closed)

Mr. D. Wallis of Cheam operates signals from the open box at Sheffield Park



L.B.S.C.R. 0-6-2T No. 473, N.L.R. 0-6-0T No. 2650, Aveling and Porter flywheel locomotive, 0-4-0T 'Captain Baxter' from the Dorking Greystone Lime Company, 0-4-0ST retort house locomotive from the North Thames Gas Board, 'Bluebell', 'Primrose', a second S.E.C.R. 'P' class engine in original livery, and 'Fenchurch', a sister engine to 'Bluebell', built in 1872.

The rolling stock has also been augmented from time to time, and now includes an S.E.C.R. 'Birdcage' 3rd brake of 1909, the 'Chesham' set of three coaches mentioned previously, an L.N.W.R. observation coach, a brake van, a buffet car, the last 'Birdcage' coach, a veteran six wheel coach, and two L.S.W.R. coaches.

BICYCLES TO SUIT EVERYONE

by Leslie B. Howard



Macmillan's bicycle of 1839

WHEN blacksmith Kirkpatrick Macmillan rode his modified hobby-horse through the Scottish night a hundred and twenty years ago he demonstrated the efficiency of a 'bicycle' driven by cranks. It is for this that he is regarded as the inventor of the bicycle, though of course two-wheeled locomotion had been known in velocipede form since the eighteenth century.

To ride those early machines one had to be tough. They were unsprung, cumbersome, with heavy cart-like wheels and the roads over which they were propelled bore more resemblance to a quarry than the Queen's Highway. Macmillan's brilliant adoption of cranks was a big step forward, but it was really the Rover Safety of 1885 invented by J. K Starley, followed immediately by John Boyd Dunlop's development of the pneumatic tyre, which set the pattern for modern cycling. Starley's clever combination of certain features — hollow tubes, wire wheels, ball bearings, chain drive to rear wheel—produced a standard type which in evolved forms survives today.

But some styles of the 1960s are different, though the curious thing is that whether your choice takes you to a tourer, a sports model, a roadster or one of the new designs your cycle will conform to a basic pattern — the handlebar, saddle, and pedals will, irrespective of make, size or shape, have the same fundamental relationship. This was the important discovery made by Alex Moulton, inventor of the cycle which bears his name and also of the unique suspension systems on the BMC Minis.

He found that, if the handlebar, saddle and pedals were regarded as the corners of an unalterable triangle, then it did not much matter what happened to the rest of the cycle.

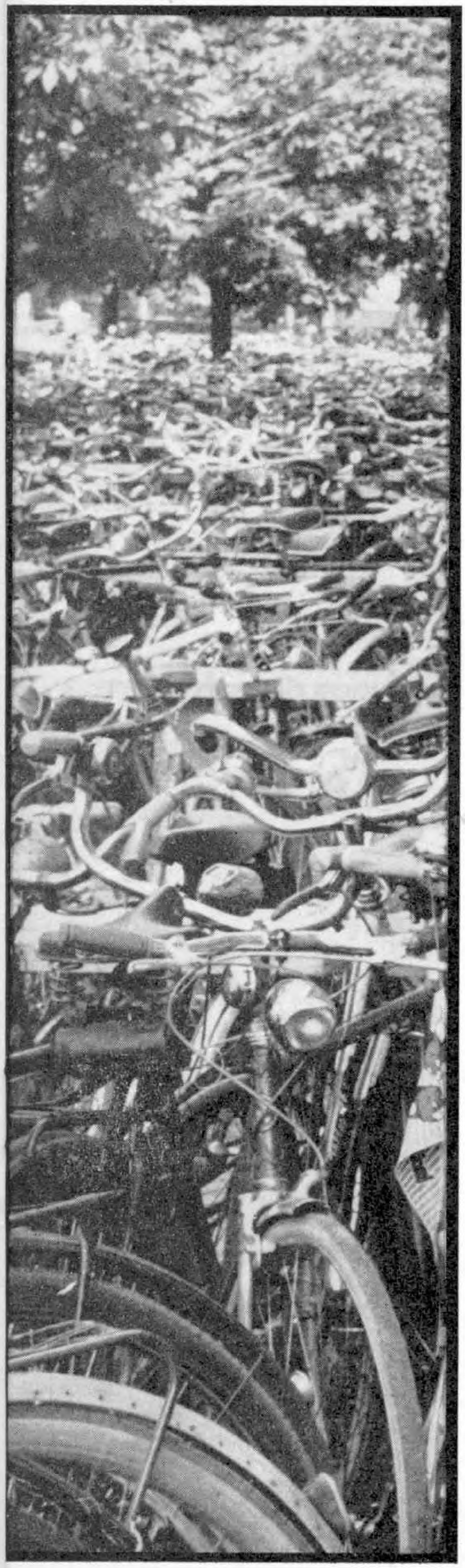
If cycles are so much alike what is there to choose? The answer is in what you expect. Each form has evolved to fulfill a particular need, so let us look first at the traditional types and see what they offer.

Roadsters and Tourers

The roadster, with its roller brakes, sit-up-and-beg handlebar and its heavy frame was the standard pattern at the turn of the century. Few are made today because the lighter, speedier tourer has superseded it, but it still has certain merits, chief of which are its cheapness—it is the least expensive to buy—and its reliability—there is over 60 years' experience behind its design. It is tough and durable and it will take a lifetime's punishment without complaint.

For someone who wants a 'knock-about' bicycle the roadster can still be a good buy. Its tyres are slightly broader than those of standard sports and tourer models and consequently they give a softer ride. With a better saddle than is normally supplied, and with the benefits of a three- or a four-speed hub, the roadster despite its old-fashioned appearance is still a useful maid-of-all-work.

Its principal disadvantage lies with the braking system—rod and stirrup type—which pulls the brake blocks onto the inside of the rims. Because of this the brakes have a tendency to snatch if the rims become scored or corroded. Moreover, the stirrups which hold the brake blocks have to be unbolted from their guides whenever a wheel is taken out. This disturbance of the brakes is a double nuisance because adjustment of the control rods is not always easy, particularly if they have been exposed to the rigours of a few British winters! But the biggest irritation is the brakes'



exasperating jerkiness when a wheel loses its concentricity or develops a side wobble, even quite small.

I think it was this old-fashioned braking system more than anything else which turned people towards the tourer with its cable-controlled caliper brakes. The flexible cables allow a tourer's handlebar to be raised or lowered without disturbing the brake linkage. In addition, since caliper brakes grip the *side* of the rim, a wheel can be withdrawn without interfering with them, and because of a little 'play' in the caliper anchorage slight wheel wobble in the vertical and horizontal planes can be tolerated.

We all know, of course, that wheel wobble must be corrected if a wheel goes out of true 20 miles from home the rider usually has to get home with it.

The tourer possesses several other advantages. It is lighter and can therefore be ridden a greater distance than the roadster for the same expenditure of energy; and it will accept alternative gear systems —the hub type of which Sturmey Archer is the most noteworthy, and also the derailleur, of which Benelux is an excellent example. Moreover, the rider is not stuck with an unalterable shape of handlebar; he can choose one to suit his personal riding habits.

In their early days, tourers were more fragile and they were ridden by enthusiasts who could afford time to care for them, much as sports cycles are regarded by their owners today. But the tourer of the 1960s is a sturdy machine that will give years of faithful service.

Sports and Springs

Its refined relative, the sports cycle, is for the keen bicyclist. Its frame is very light, its tyres often narrower, and saddle and handlebar are designed for a pronounced lean-forward 'racing' position. It is not the cycle to use for shopping errands where it may be accidentally knocked over while parked at the curb. The frame is exceptionally strong for its weight, but it is constructed principally to withstand stresses imposed by the machine's normal function; a fall at the curb may distort it and since it is not a cheap thing to buy it is commonsense not to place it in situations where costly repairs arise.

Until the 1960s cycles had remained unchanged fundamentally since Starley invented the Rover Safety, and the diamond pattern for the frame was almost universally accepted as the ultimate. But Alex Moulton proved otherwise. His revolutionary design was created to meet three conditions. First, he wanted a cycle that a man, woman or ten-year-old child could ride; secondly, it should have a proper place for carrying parcels; and thirdly, the centre of gravity should be as low as possible.





The low frame satisfied these conditions but it necessitated small wheels which required harder tyre pressures with a consequent rougher ride. To restore comfort, Moulton ingeniously sprung the frame with a suspension system that

Above: the Royal Enfield 'Revelation' is a versatile machine

Left: Brown Brothers' Vindec 'Minor' for the junior cyclist

cunningly employed the elasticity of rubber with the tenacity of steel. (The drawing explains the technical details.)

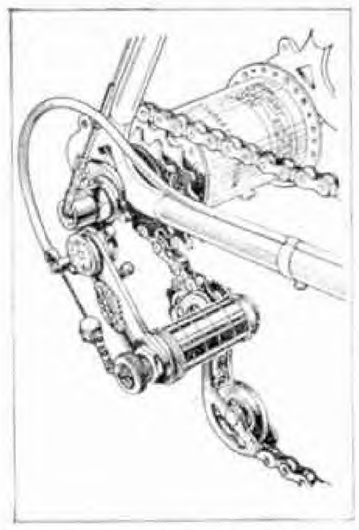
Other companies have since produced machines to satisfy these three conditions —the Raleigh R.S.W.16 and the Royal Enfield Revelation are examples—but they fit oversize tyres instead of springs to soften the ride. On these low-frame machines, quick-release levers provide a rapid means of adjusting saddle and handlebar to suit a rider's height.

Traditional machines have a limited range of adjustment so manufacturers supply frames of varying height to suit individual requirements, and of course, junior cycles for the younger rider. In all respects except size these smaller machines duplicate the larger ones.

Bits and Pieces

A cycle is a functional unit, but it is naked without a complementary set of accessories. A saddle bag with a basic set of tools and a puncture outfit, a pump, a bell, and a lighting set are essential. If a cycle is used after dark the law requires that it has a white light shining forward and red one to the rear. For short journeys, battery lighting fulfils this need, but for longer rides or continual use the dynamo set is superior.

A good set of accessories aids the rider's comfort, and to enjoy cycling one must be comfortable. This brings up the question of riding position into which I will go next time when I write about choosing a new or second-hand machine.

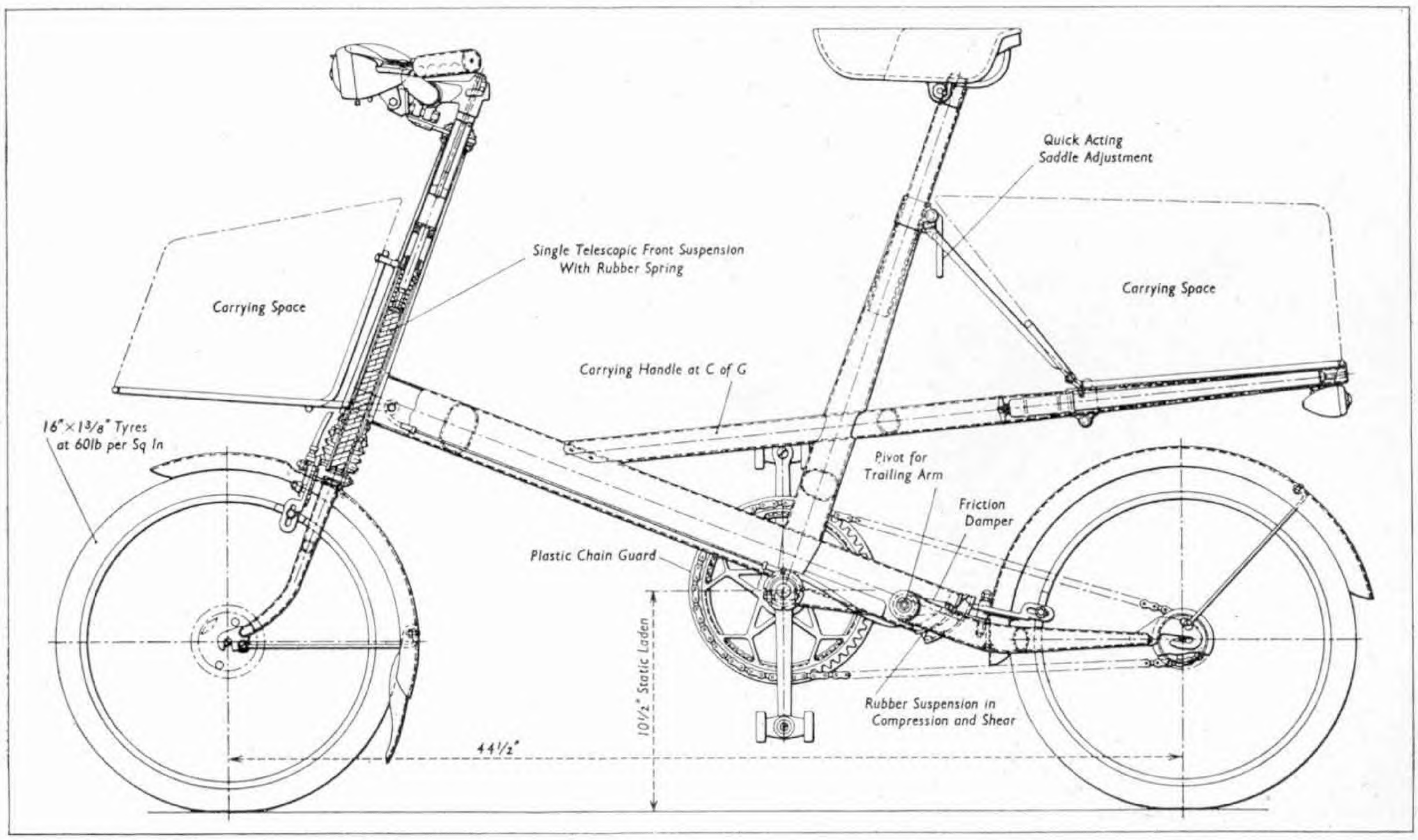




Left: different speeds in the derailleur variable gear, here illustrated with a Benelux, are achieved by the chain 'jumping' to sprockets of different sizes. A spring-loaded toggle maintains chain tension. This drawing also shows the Sturmey Archer hub gear which operates, like automatic car gears, through an epicyclic train. Right: the Carlton Franco-Italia sports machine



Right: the Raleigh R.S.W.16. Below: details of the revolutionary Moulton



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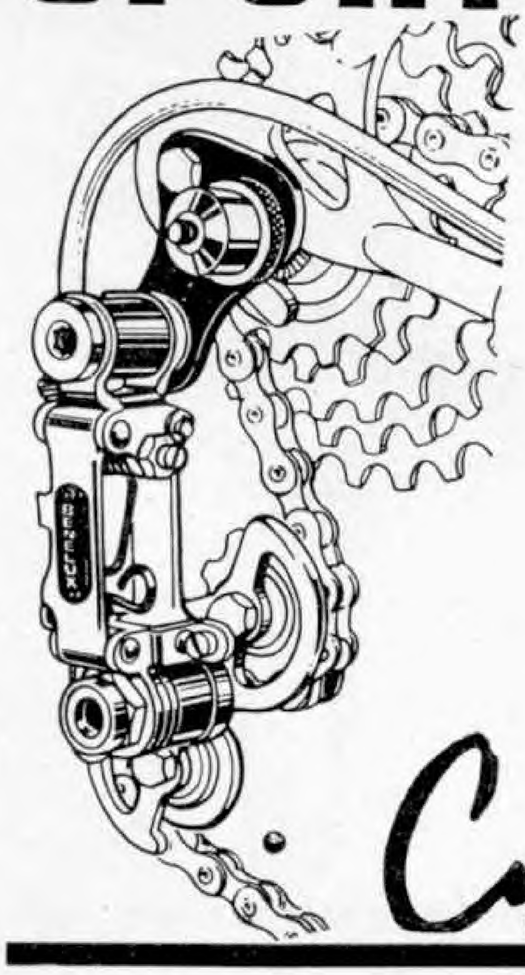
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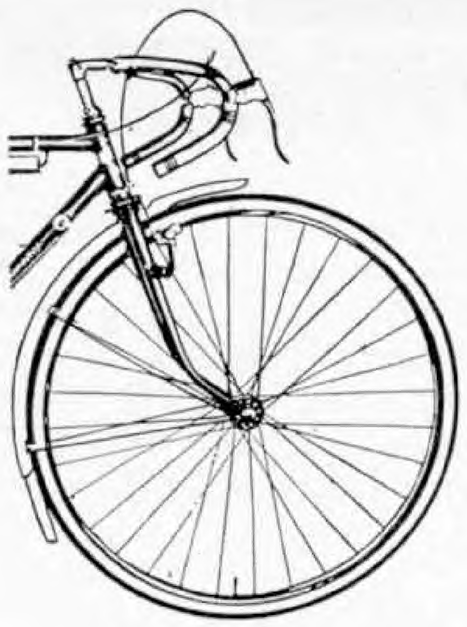
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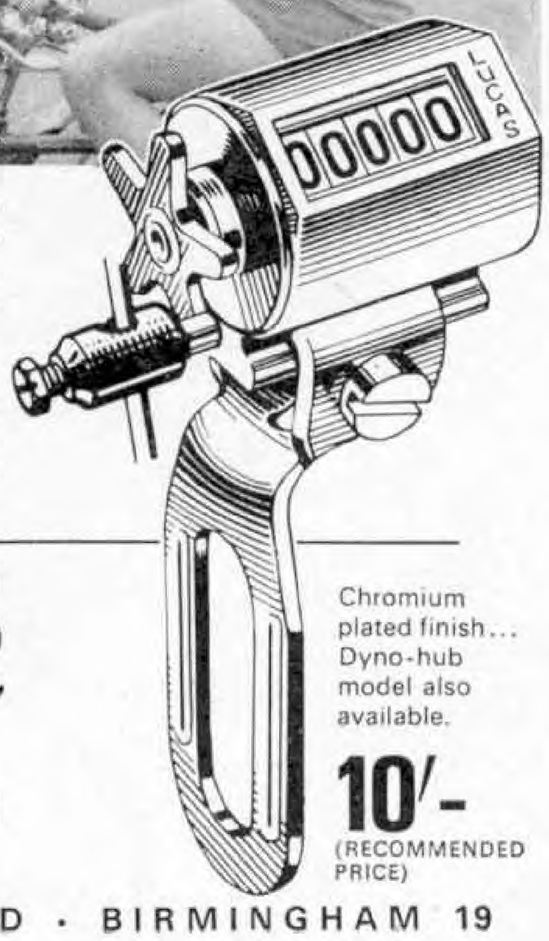


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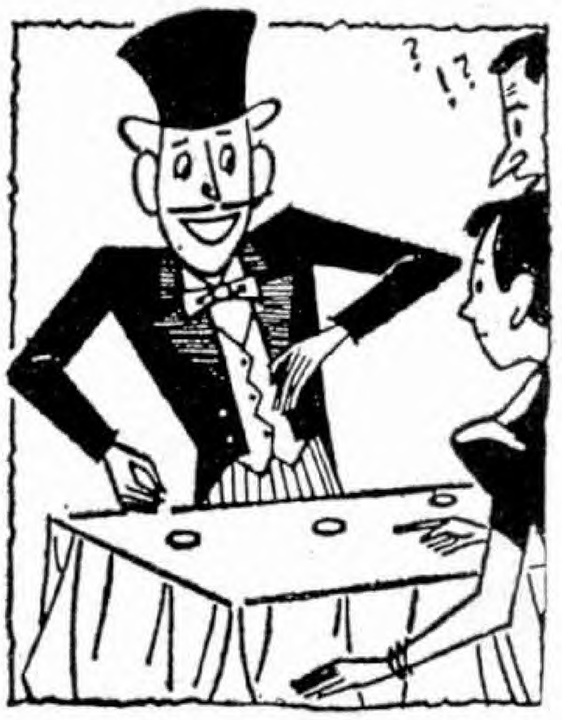
Solutions to the puzzles on this page appear on page 35

Wanna make a wager?

There are some bets you can make with almost certain results. For example:

A better places three coins in a row on a table or other flat surface. He places the middle coin so that it is slightly closer to one of the outer coins than to the other. Then he asks someone to point out the two coins which are farthest apart on the table. 'Wanna bet'? he inquires of the onlookers who may feel that for once they have outtricked the trickster.

Opponents generally pick out the obvious pair. In which case they are wrong, of course. The two coins farthest apart are the two outer coins—the ones at the extremities.



Tricky Teasers

A 'The heaviest and lightest of my men weigh twice as much as a third man,' said a police inspector to a friend. 'The heaviest man is four stone heavier than the lightest, whose weight and that of the second heaviest total 22 stone.'
What is the weight of each man?

B Can you change Boot into Lace? It can be done, if in words only, simply by altering one letter at a time (and making a good dictionary word at each step) until the required word is reached.
For example, this is how it works with four intermediate words:
BOOT—— BOOK—— LOOK——
LOCK—— LACK—— LACE.
Get the idea? Now try your hand at altering WIND into RAIN, but this time using only *three* intermediate words.

C Here's another problem. The difference between two numbers is 4, and that between their squares (that is the numbers multiplied by themselves) is 48. What are the two numbers?

D Take away one letter from each of the following words, replacing it with another, and also rearranging the *order* of the letters each time. You'll find a hidden proverb!
LAW SO TEN LOAD HATE SETTLING



I told you to leave that trampoline alone!

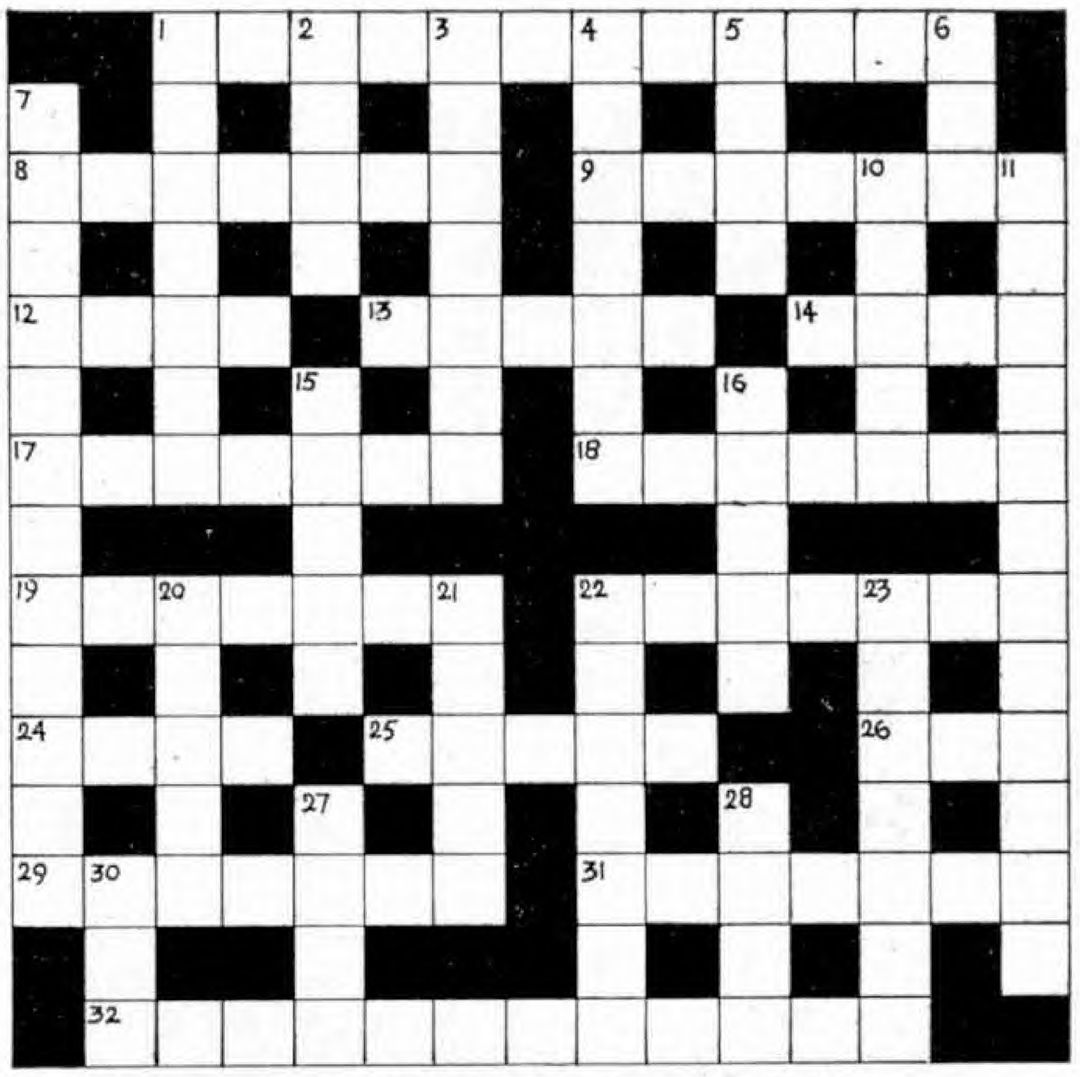
Crossword Puzzle No. 14

Clues

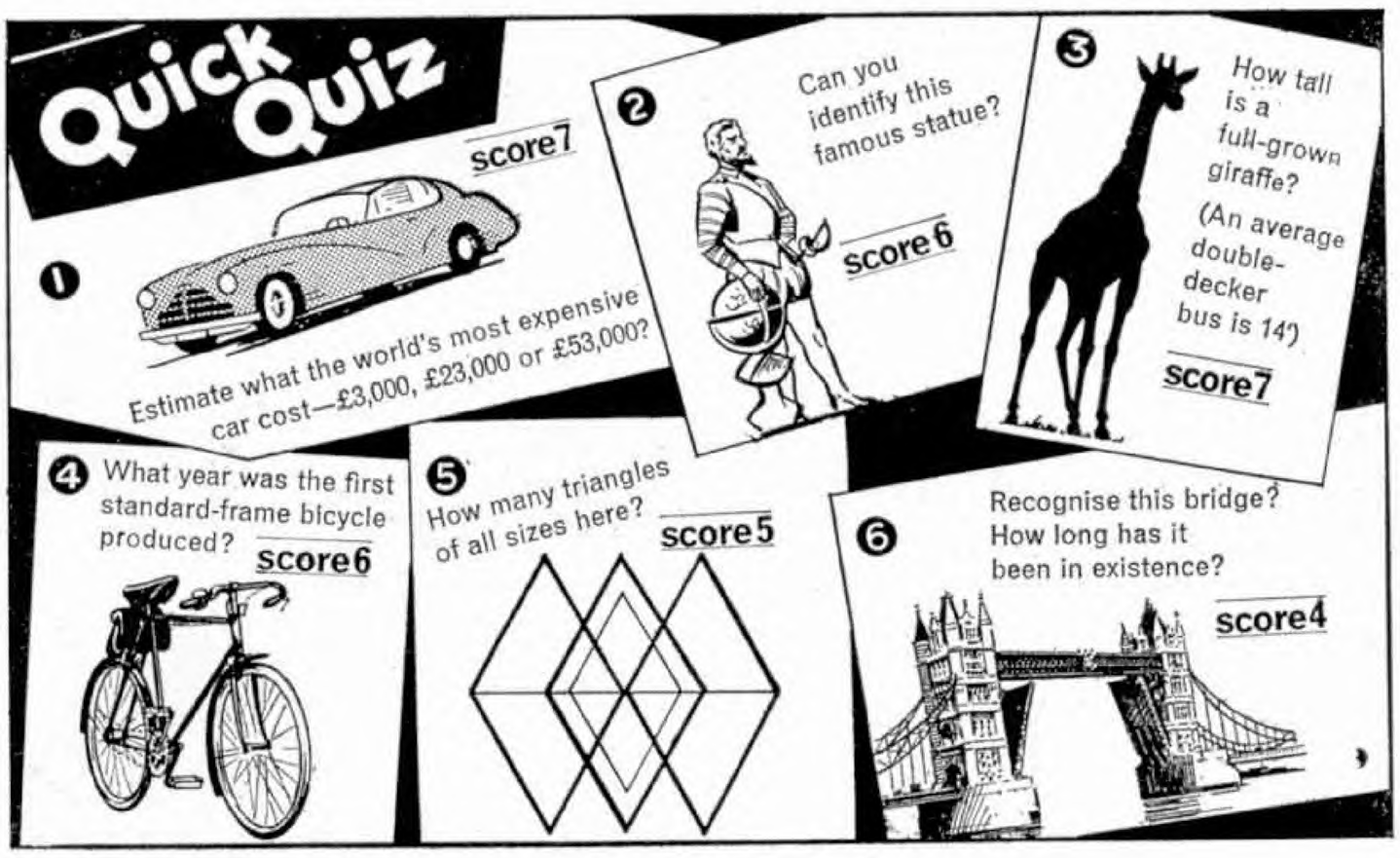
ACROSS
1 Festival ceremonies
8 Wound in reverse
9 A choral work
12 They're slippery!
13 Plus's opposite
14 Stolen treasure
17 If you're not alert you may be caught

18 Most soccer clubs have one
19 Hard labour
22 South American country
24 Apartment
25 Mournful cry
26 A Govt. information office (abbrev.)
29 One who shows the way
31 Don't sit on this
32 Island off Canada

DOWN
1 Wild flower
2 Noisy
3 It's done at auctions
4 Bill
5 Scottish island
6 Sit in the past
7 Not according to natural laws
10 Oak fruit
11 Choice between several things

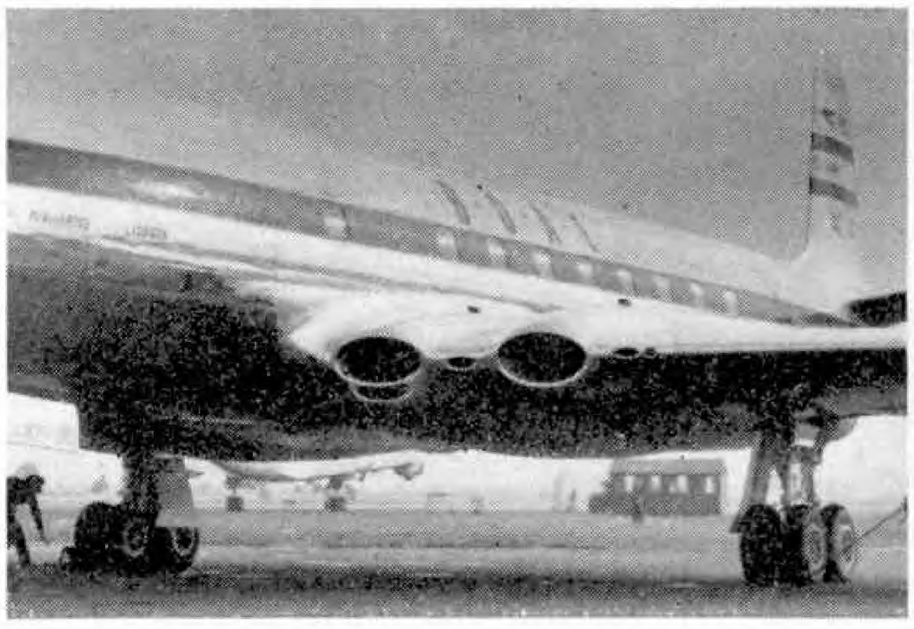


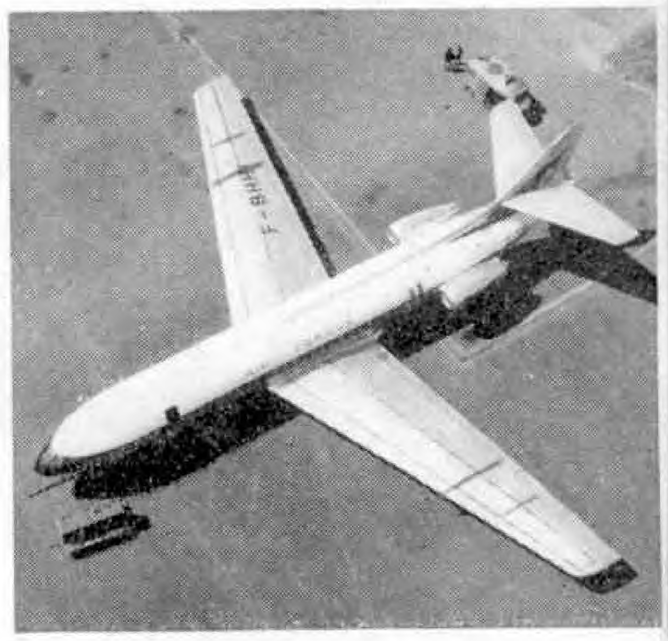
15 Type of grass
16 Article of furniture
20 Swiss ski resort
21 Used for spinning
22 Made too late
23 Left empty
27 A tasty meat
28 Italian money
30 Even (poet.)



John W. R. Taylor

BOEING'S BACK TO FRONT JET-LINER





Left: the D.H. 'Comet'—clean and graceful with its buried engines.
Right: the French 'Caravelle' sets the new pattern with its rear-mounted engines

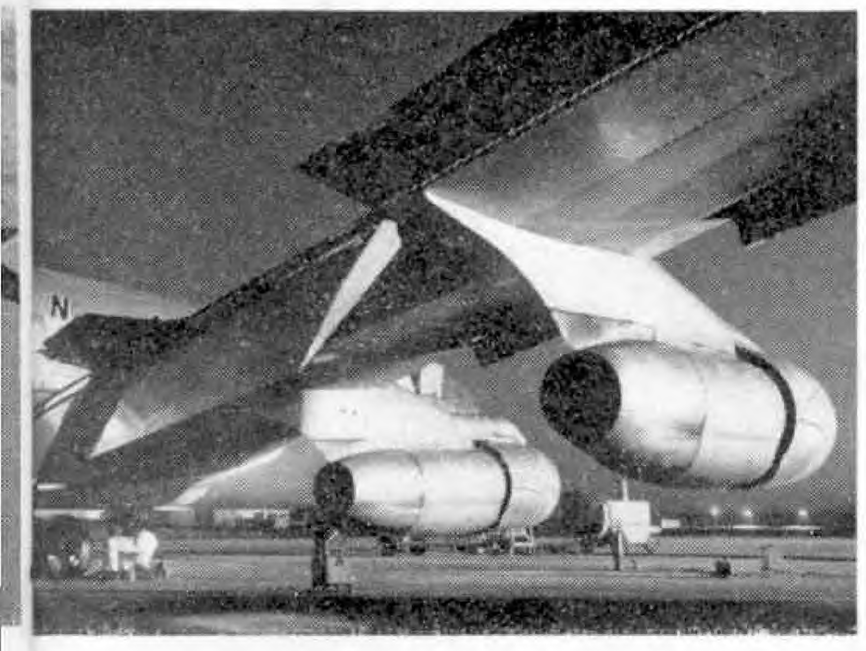
AT Seattle, in the north-west corner of the United States, a new airliner is taking shape that will cause as much controversy as did the Caravelle when it first flew in 1955. By carrying its engines on each side of the rear fuselage, the Caravelle set a fashion that has been followed by almost every jet-liner designed in the past ten years. Britain's VC 10, One-Eleven and Trident, America's DC-9 and Boeing 727, Russia's Tu-134 and Il-62, and a host of smaller types, all have rear-mounted engines.

It caused a great deal of surprise, therefore, when the Boeing Company announced last year that their new Model 737 short-range jet-liner would carry its engines in underwing pods. The arguments in favour of rear-mounted engines had been so convincing that it was as if British Rail had decided suddenly to go back to steam locomotives on all express trains. But Boeing have built more jet transports than any other manufacturer in the world, gaining so much experience in the process that their competitors must be wondering if it is wise to continue putting all their money on rear-engine layouts.

Why does the fashion in airliner

The reasons for the various types of engine mountings are set out on these two pages





Strung out along the wing in pods are the Boeing 707 engines

design seem to change so frequently? For the answer we must go right back to the late 'forties, when Britain built the world's first jet-liner, the D.H. Comet 1.

Engine powers were comparatively low at that time, and the four Ghost turbo-jets in the Comet gave a total of only 20,000 lb. of thrust, which is less than the output of one of the engines of the VC 10. Streamlining was of the greatest importance, to make best use of the available power, and de Havilland's designers reduced 'drag' to a minimum by burying the engines in the wing roots. This created structural problems, as it meant that the engines had to pass through the two main wing spars. Great care was necessary to ensure that the high temperatures built up inside the engines could not damage the airframe or cause the fuel in the wing tanks to heat up dangerously. But there were advantages as well. For example, the undercarriage could be kept quite short, which saved weight and simplified loading and unloading of the cabin and freight holds.

When the Russians produced their first jet-liner, the Tu-104, this too had its engines in the wing roots; but by then a different fashion was in vogue in America —the podded engine. It was not new. Boeing's two big jet-bombers, the B-47 and B-52, had been flying with engines in underwing pods since 1947 and 1952 respectively, and it was logical that they should choose a similar layout for their first jet airliner, the 707. Douglas followed suit in the DC-8, as did Convair with their 880/990 series.

The podded engine

By the mid-fifties, jet engines were becoming much more powerful, so the extra drag of underwing pods was less serious. By using them, it was possible to eliminate the structural problem of running the wing spars around the engines, and it was much easier to service and replace a podded engine than one that was buried in the wing roots. Also, the absence of engines inside the wing permitted the use of a thinner, high-performance aerofoil section and, of course, the fire hazard was reduced.

Some problems remained. For example, the underslung engines were so close to the ground that there was a risk of 'hoovering' up stones and other objects from the parking apron and runway, and so causing damage to the compressor blades of the engines. It also seemed likely that if the aircraft dipped a wing during take-off or landing the engines might be knocked off. However, the advantages outweighed the disadvantages. 'Hoovering' was reduced on some aircraft by using a downward blast of air to blow aside any debris likely to enter the engine air intake, and the possibility of scraping a pod on the runway proved to be slight.

An unexpected advantage came to light later, on one or two occasions when a jet-engine caught fire or disintegrated in flight. If the engines had been buried in the wings, they might have caused so much damage that the wings would have come off. Instead, in each case, the pilot was able to make a safe landing, with the engine pod damaged beyond repair or even missing completely.

By the late fifties, therefore, nobody thought any longer in terms of burying the engines inside the wings of new designs, although the Comet 4 and Tu-124 inherited this layout from their predecessors, the Comet 1 and Tu-104. But the underwing pod faced a new challenge from the Caravelle's rear-fuselage pod.

The rear engine

The advantages of the rear-engine layout seemed overwhelming. It improved aerodynamic efficiency, by leaving the wings entirely free of air intakes and bulges, or pylons to carry underwing pods. The danger of 'hoovering' became less, as the air intakes were further from the ground. For the same reason there was less danger of people or equipment being sucked into the intakes or hurt by exhaust blast. If one engine failed in flight, the closeness of the other to the aircraft's centre-line reduced handling and control difficulties. And the risk of wing damage or fuel fires following an engine break-up was eliminated.

What is more, passengers soon discovered that putting the engines down the back end made the cabin quieter than on any other airliner.

Why, then, have Boeing moved the engines back to the front on the 737? The basic answer is that they want to carry up to 113 passengers in a comparatively small airliner. Seats cannot be put in line with the engines in a Caravelle-type design, as the noise would be too great; so the rear end of the fuselage has to be left empty or used for baggage and freight. By putting the engines in underwing pods, this drawback disappears and the whole fuselage can be filled with seats. All the old advantages of underwing pods still apply, and loading is easier, as passenger seating does not have to be worked out carefully for each individual flight in order to 'balance' the weight of engines at the tail.

In addition, Boeing calculate that they have saved 1,500 lb. of structural weight by using underwing pods.

In flight, the wings of an aeroplane tend to bend upward in a curve from root to tip. To reduce this flexing and the risk of breakage or metal fatigue, the wing structure has to be made very strong. However, if the engines are hung underneath in pods, they help to 'hold the wings down' and the structure can be made of thinner and lighter materials. Every pound of structure weight saved makes it possible to carry another pound of payload and so earns more money for the airline operator.



A graceful picture is made by this Boeing 727 in flight

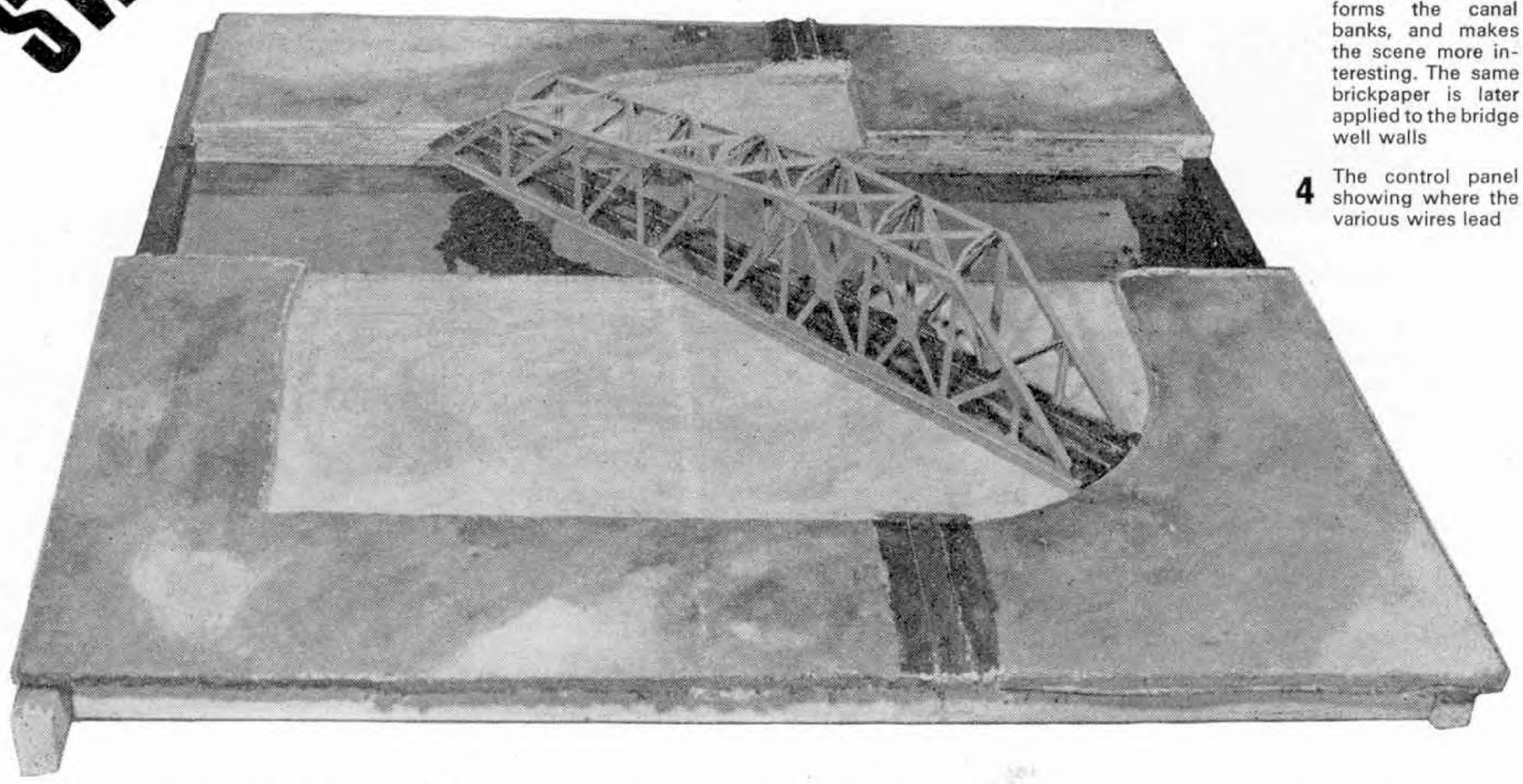
There are other advantages, too technical to describe here—just as some of the advantages of rear-mounted engines mean little to anyone but a highly-trained technician. But there is one more big problem that is avoided in the 'back-to-the-front' Boeing 737. This is the deep stall—a condition into which any aircraft could get if it is fitted with rear-mounted engines and a tailplane at the top of the fin. Once in such a stall, it cannot be pulled out and will crash.

So far as we know, this has happened only once to a modern jet-liner; that one was an experimental prototype, and it certainly could not happen to any of the British-built aircraft now in service. Long before they reached the stage where they would enter a deep stall, they would be put into a nose-down attitude automatically by their specially-designed control systems. But the problem does not exist at all in aircraft with underwing engines and a low-set tailplane.

Does this mean that all future jet-liners will have underwing pods? This is doubtful, as the rear-engine layout has so many advantages. About the only certainty is that the first supersonic airliners will carry their engines under the wing, because the Concorde, Russian Tu-144 and the two U.S. designs all use this arrangement. However, the underwing layouts chosen for the Concorde and Tu-144 also put the wings at the rear of the aircraft—so their particular designers have found a way of getting the best of both worlds!

SWING IT

Part 3. Conclusion—by Mike Rickett



1 Applying a layer of plaster to the curved end pieces of the bridge

2 The canal surface going into position

3 The Superquick brickpaper transforms the canal banks, and makes the scene more interesting. The same brickpaper is later applied to the bridge well walls

4 The control panel showing where the various wires lead

IN this series I have so far dealt with the construction of the swing Bascule bridge and last month, the construction of the bridge base. In this, the concluding article, I shall describe the final trimming of the bridge-well, painting the surface, supporting the bridge, and the construction of the canal and the control panel.

Clearance between the bridge ends and the sides of the bridge well is most important and must be tested by turning the bridge with a fibre tipped pen held at the bridge end to mark any projections along the two curved well walls that actually touch the bridge ends. Once marked in this way these can be removed with a sharp modelling knife. A thin coat of plaster, consisting of a normal mixture of Polyfilla, can now be spread along these, which should be quite smooth afterwards.

Although you will find the bridge surprisingly strong, it will have a tendency to dip at the ends when a weight such as a locomotive is placed upon it. Providing, however, that the ends are supported in some way, this is nothing to worry about, especially since the bridge would not normally carry a train while actually turning. I therefore placed two supports on the base, one at each end of the bridge, when in the 'cross' position. The supports, which are very easily cut from pieces of softboard, should be the full width of the bridge in length, and about $\frac{1}{2}$ in. to $\frac{3}{4}$ in. wide. I have also included a slope at both ends to improve their appearance. The height, however, is the only really important dimension, and this you will have to judge for yourself by cutting a fibreboard block high enough to allow the bridge to turn, but not low enough to give insufficient support. I would advise cutting the blocks a little too high and then judging the final height by gradually trimming until the bridge-end travels over easily. The trimming is best done with a sharp modelling knife used to peel off successive layers of the fibre. When the block is the correct height, peel off an additional $\frac{1}{64}$ in. and then give the surface a thin coat of Polyfilla.

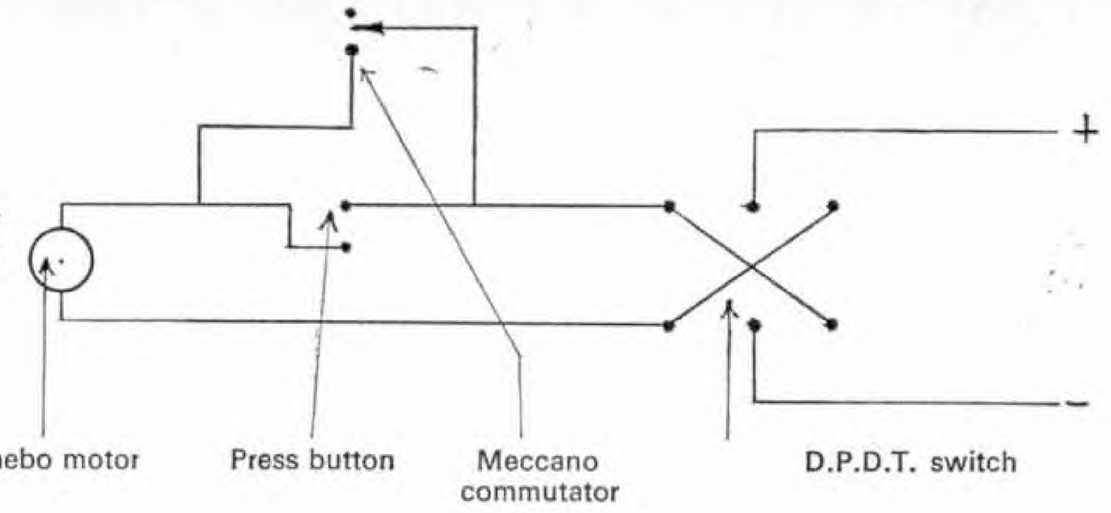
The track on both sides of the base may now be laid and aligned with the track running along the bridge. The correct positions of these two tracks can be found by turning the bridge until it reaches the end of its travel. The position of each bridge-end can now be marked on the adjacent baseboard. The height of the track on the base is most important and you may find it necessary, if your earlier work was a little inaccurate, to either pack up the track with a piece of cardboard, or lower it until the two sets of rail ends are lined up correctly. If you are unable to avoid doing the latter, peel off, to the width of the track bed, a layer of the softboard surface forming the well bank. The dipping action of the bridge end must be allowed for when doing this, and it might in fact be best to place a locomotive at one end to give an indication of the amount to cut away.

The bridge ends, which in the Airfix kits are square, require two additional pieces glued underneath the rail ends to give the appropriate curve. I used pieces of 30 thou Plastikard, cut to the correct size for each end, with the bridge-well curve cut out, and glued with a contact adhesive into position underneath the rail ends. The upper surfaces of these two pieces are coated with Polyfilla mixed with a little sand which, when dry, is painted black, like the rest of the base.

The canal

Construction of the canal is surprisingly easy, and for the surface I would recommend clear Styrene sheet brushed down on both sides with cellulose thinners to which is added a little brown and black cellulose paint to melt the surface of the Styrene and make it semi-opaque, but without removing the sheen from its surface. Both sides are allowed to dry thoroughly before a coat of clear varnish is brushed on the upper surface and this is also allowed to dry before a second coat is applied. It should be dried in a warm, dust-free room or cupboard.

Two pieces of Balsa, 2 ft. 6 in. long, $\frac{1}{2}$ in. thick and 1 in. wide, are placed on end and on either side of the lower hardboard surface of the canal. When glued into position, the top edges may be painted black and allowed to dry. The canal surface, which should be a tight fit, is then placed on top of the two supports. You will probably not find it necessary to glue the surface down, but if it should be loose, fix it into position with a contact adhesive.

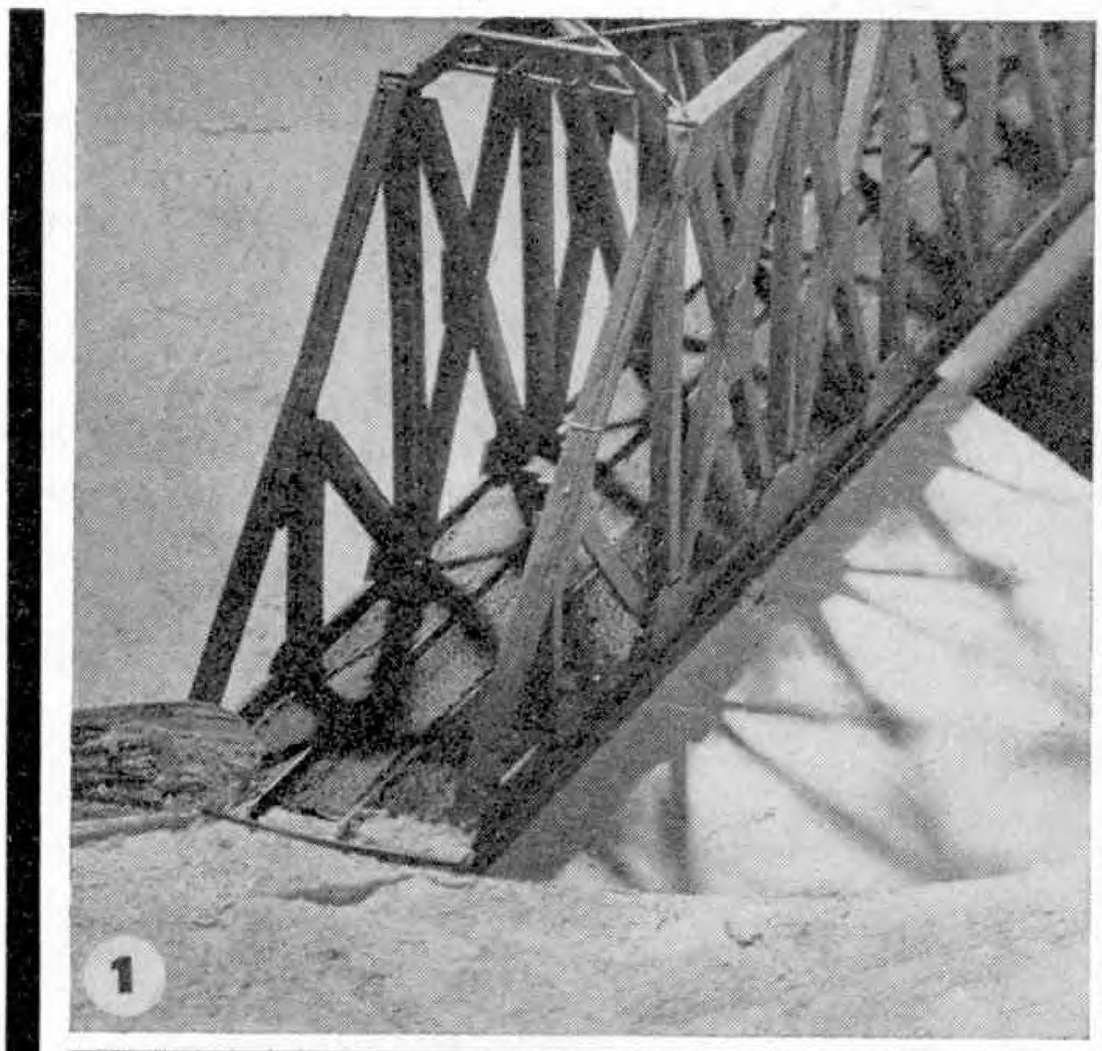


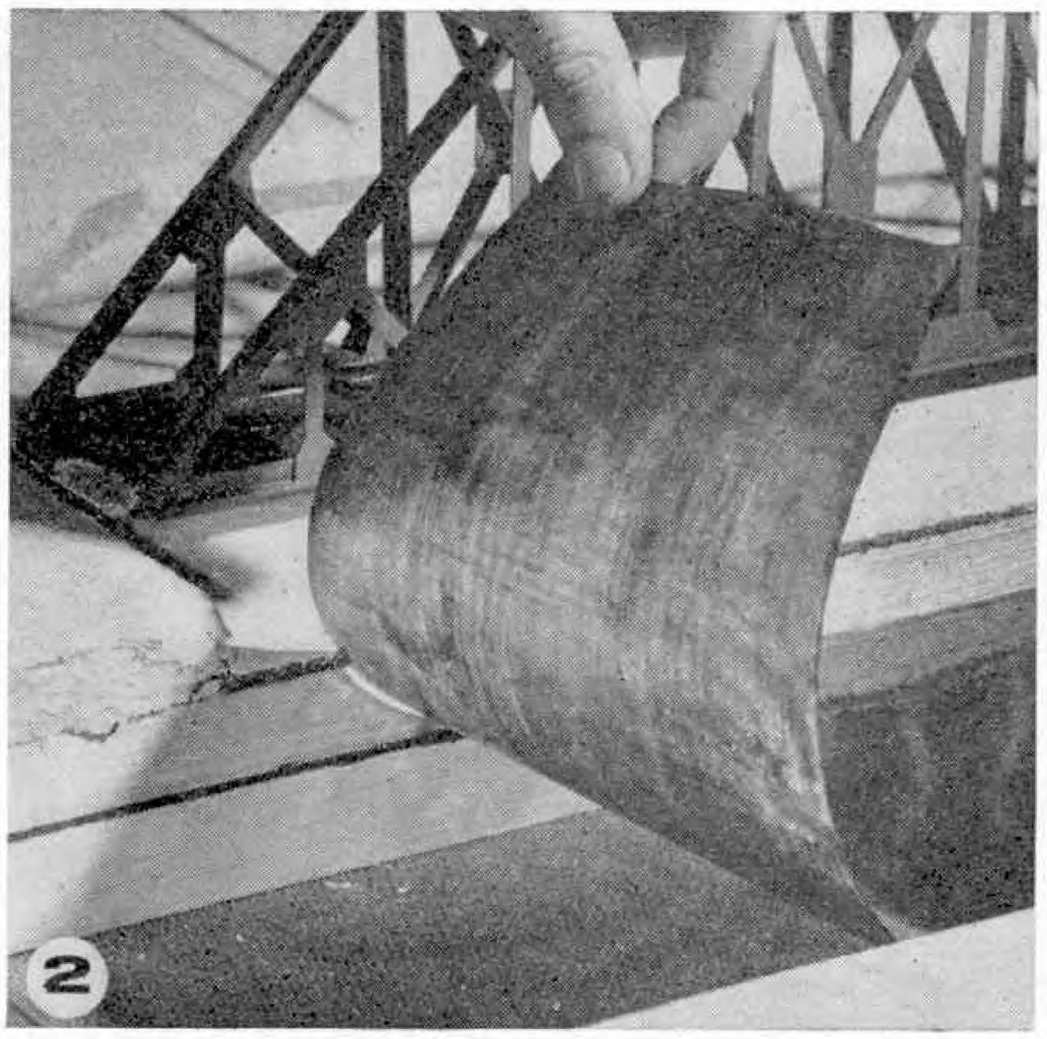
5 Wiring diagram for bridge mechanism and control panel

Once the canal surface is in position, the banks can be brickpapered. I have used the Superquick D8 'Grey Sandstone Walling', which I found most pleasing and very effective. Using a sharp modelling knife, I started by cutting the paper into strips, the depth of the canal, and then glueing the pieces on with a P.V.A. glue. Once this has been completed, the edging stones can be glued along the tops of both banks, and brickpaper fixed to the inside walls of the bridge wells.

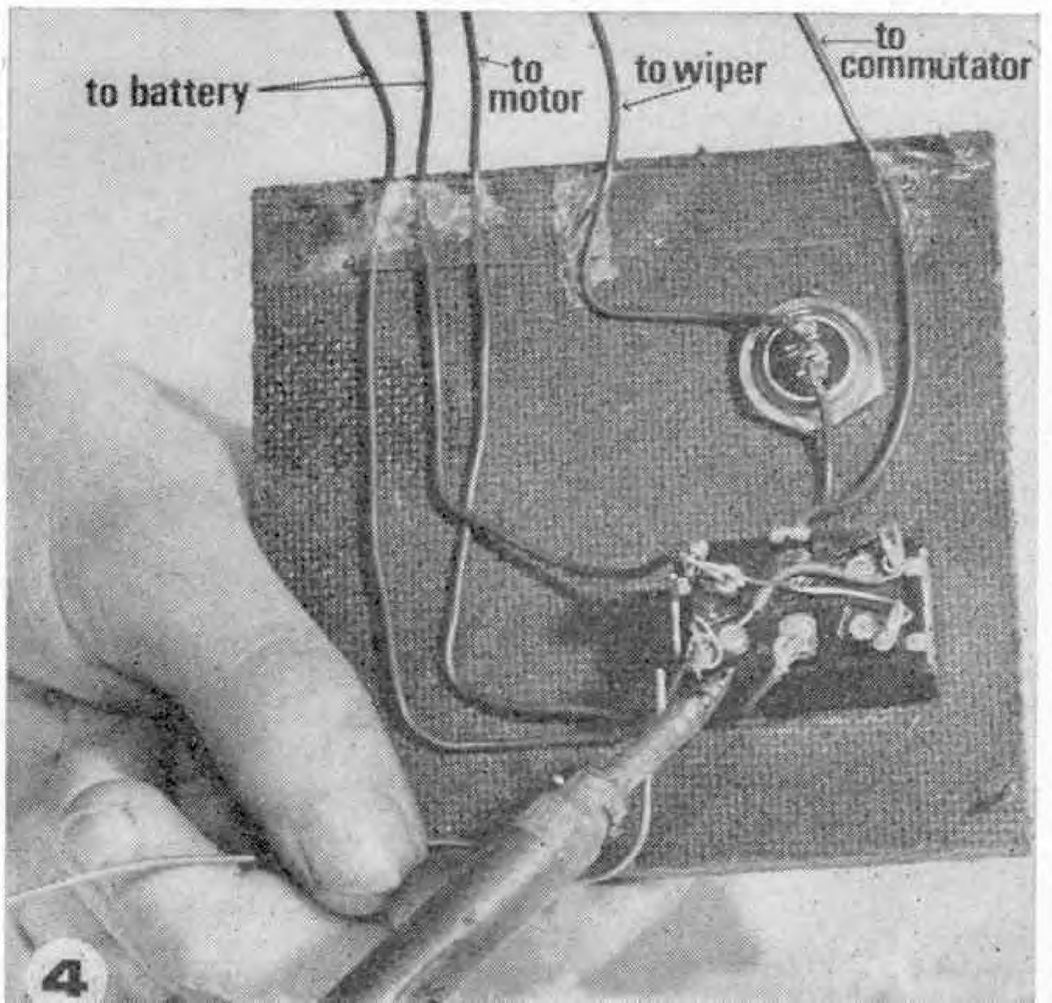
I have always preferred water base paints for scenery, and on the bridge base I have used powder colours of the sort that is available in tins made by Winsor and Newton. A very comprehensive and useful range of colours is available. Buy some Burnt Sienna, Raw Umber, Black, White, and Brilliant Green. The Black, although frowned upon for this purpose, can be used for darkening any of the other colours and also, in conjunction with white, for making grey used on the bridge well bases. The banks, with the exception of the track beds, can be given a coat of Burnt Umber, Raw Sienna and Green, painted to give a patchy appearance, with the green in only occasional subdued patches. You will find that these water paints have a tendency to dry considerably lighter, and it will almost certainly be necessary to give two, or possibly three coats before you have the texture you require. Do not paint in a meticulous way, simply mix the appropriate colours on the scenery itself as the fancy takes you. With the possible exception of an overall coat of brown, do not pre-mix paints, but have a jar of water and a selection of the paints required conveniently by you. You will find that it is easier to produce a more patchy effect in this way.

The control panel is all that is necessary to complete the model and this is extremely simple to build. A square of hardboard or plywood, about $\frac{1}{8}$ in. thick and of a size to suit your own control board, is all that is needed, in addition of course to a double pole double throw switch and a press button. The wiring for this is shown in Figs. 4 and 5, and you will see from studying this, where the wires lead to, both in the bridge mechanism and on the control panel itself.

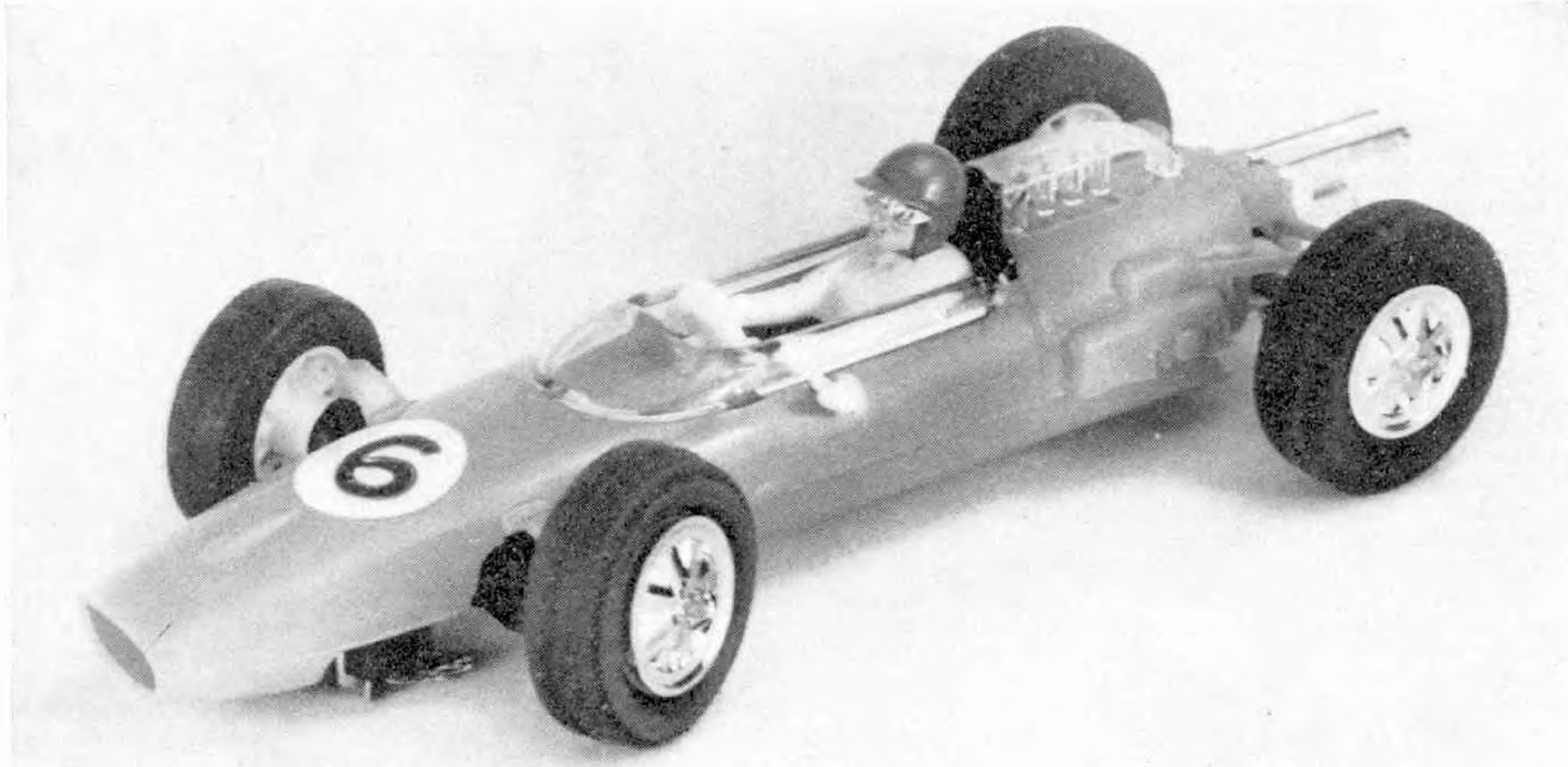

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SCALEXTRIC '66

by Pitman

TWICE-WORLD Champion Grand Prix Driver Jim Clark says in his foreword to the new Scalextric Model Motor Racing catalogue, 'The simplicity with which I can reproduce the circuits that I race on and the fantastic realism of Scalextric Model Race Meetings will never cease to amaze me'. This is a statement I tend to agree with after studying the 1966 range, existing and planned, as laid out in the catalogue.

Several of the items featured in the book are not yet on sale, but this is only to be expected, considering the catalogue must cover the whole of the year. In any case, the existing range is more than comprehensive enough to fill the wishes of most slot racing enthusiasts, be they interested amateurs or skilled experts.

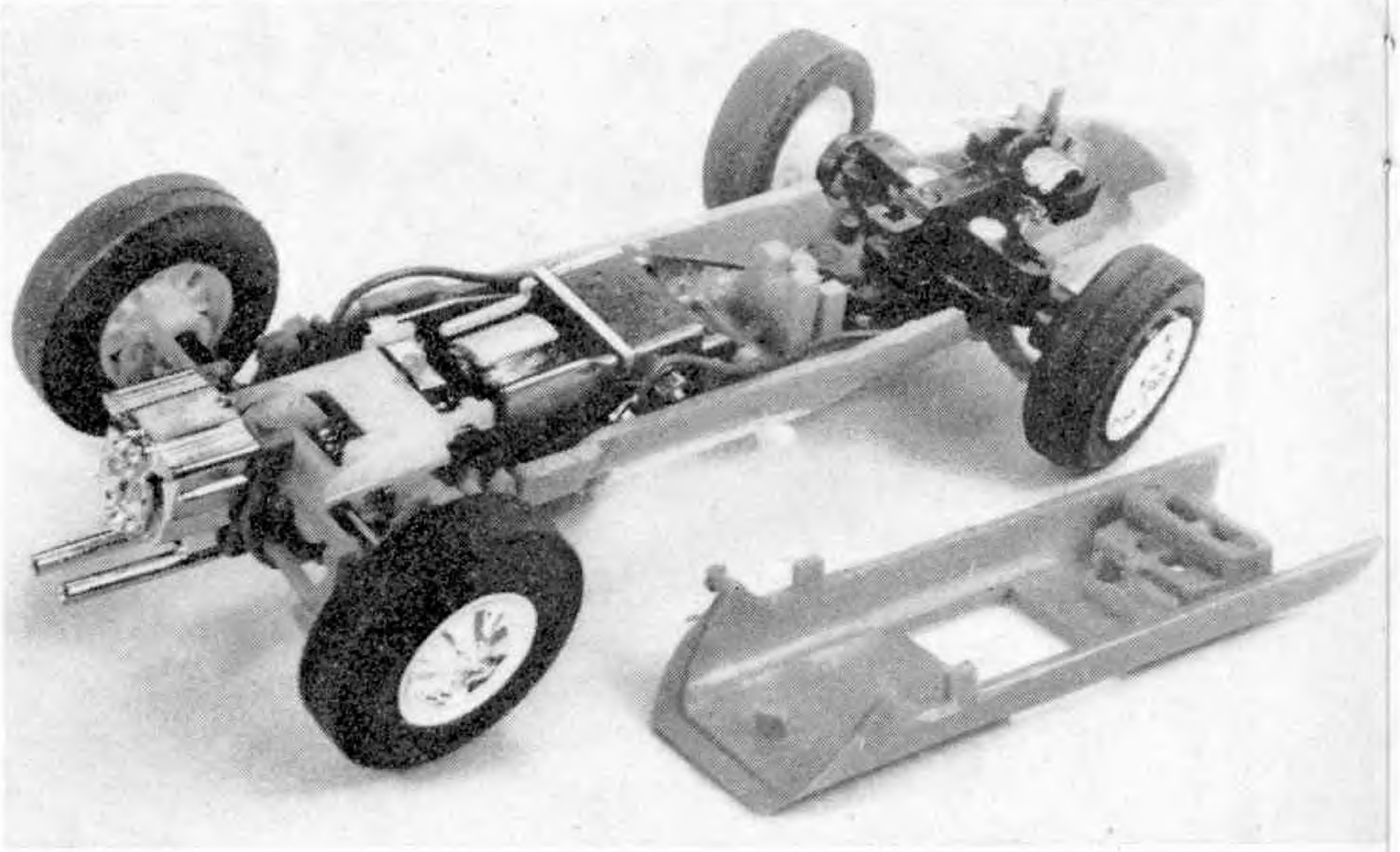
Scalextric has an amazingly wide selection of track sections. In addition to the five basic types of straight there are as many as eight different curves as well as various kinds of Chicanes, Crossings, Turnouts and Lay-bys. The Crossings and Turnouts serve the same purpose as railway points, allowing cars to change or cross tracks or even to turn out of a race altogether, perhaps into a lay-by or the pits, and the direction of the car is determined by a movable control button. A particularly useful track arrangement, sold as a complete set at 14s. 6d., is No. PT/73 Hill Climb and Dragster Turn Set. It comprises one Curved Wye Section and three Single Lane Curves and, when used with a hill-climb or Dragster circuit, enables a car to be turned round and driven back to the 'start' without any handling.

Several new track sections are planned for later in the year, one of these being a 22½ degrees Large Radius Curve to be numbered PT/84-M. Also planned is a Penalty Chicane No. A/261 that will be great for excitement. Cleverly situated 'oil drums' on a chicane section act as electrical contacts connected to a buzzer unit. If a badly controlled car skids too much on the chicane and touches one of the obstacles, it causes the unit to buzz loudly. The driver must then pay a pre-arranged penalty. The complete chicane including buzzer unit is operated from an Ever Ready U2 Battery and will sell at £1 12s. 6d.

Long-awaited additions to the system are the Lap Counter No. A/259 and Blow-out No. A/258, at 12s. 6d. and £1 12s. 6d., respectively. Moulded in red, the Lap Counter carries two tracks and automatically records up to 15 laps for each track. The Blow-out Unit also carries two tracks as well as two sprung flaps, each operated independently by a simple hand control. The idea is to activate the flap just as your opponent's front wheel drives on to it. This simulates a tyre 'blow out', causing the car to roll off the circuit in a highly realistic way.

Besides being sold separately, the Penalty Chicane, Lap Counter and Blow-

Heading photo shows the new Formula I Cooper. Below, with the under-pan removed, you can see the sturdy steering assembly and the ready-accessibility of the motor and drive unit. This car, like the Lotus on the facing page, will, become available during April



out are included in some of the self-contained Sets, which are marketed complete with cars, hand throttles, some accessories and sufficient track to form a circuit. Nine Sets are produced, being numbered '30', '31', '33', '40', '50', '65', '70', '80' and '90'. The higher the Set number, the more extensive—and expensive—the Set. Costing £8 15s. 0d., Set '65' includes the Penalty Chicane, together with standard track, straight and curved, Fly-over Bridge Supports and two Sports Cars, No. C/74 Austin Healey 3000 and No. C/75 Mercedes 190SL. Also packed with this and, indeed, with most sets, are Crash Barriers, Banking Wedges and a Start/Finish Banner.

Sets '33' (£5 19s. 11d.), '50' (£7 7s. 0d.) and '90' (£14 19s. 6d.) contain the Lap Counter plus standard track, etc. Cars contained in or planned for these three sets are, respectively, Set '33' No. C/76 Mini Cooper Red and No. C/76 Mini Cooper Green; Set '50' No. C/81 Cooper Formula 1 Car and No. C/82 Lotus Formula 1 Car; Set '90' No. C/81 Cooper Formula 1 Car, No. C/82 Lotus Formula 1 Car, No. C/74 Austin Healey 3000 Sports Car and No. C/75 Mercedes 190SL Sports Car. Set '90' is, in fact, the largest outfit manufactured, containing not only four cars and the Lap Counter, but also a great deal of standard track and accessories, plus a pair of Crossings, a Chicane and a Pit Stop Set. When sold separately at £1 12s. 6d., this last carries No. PT/90 and comprises two types of Turnout and two types of Lay-by. While these items can be operated by the earlier-mentioned control buttons, a set of cable Hand Controls will be available for operating them remotely.

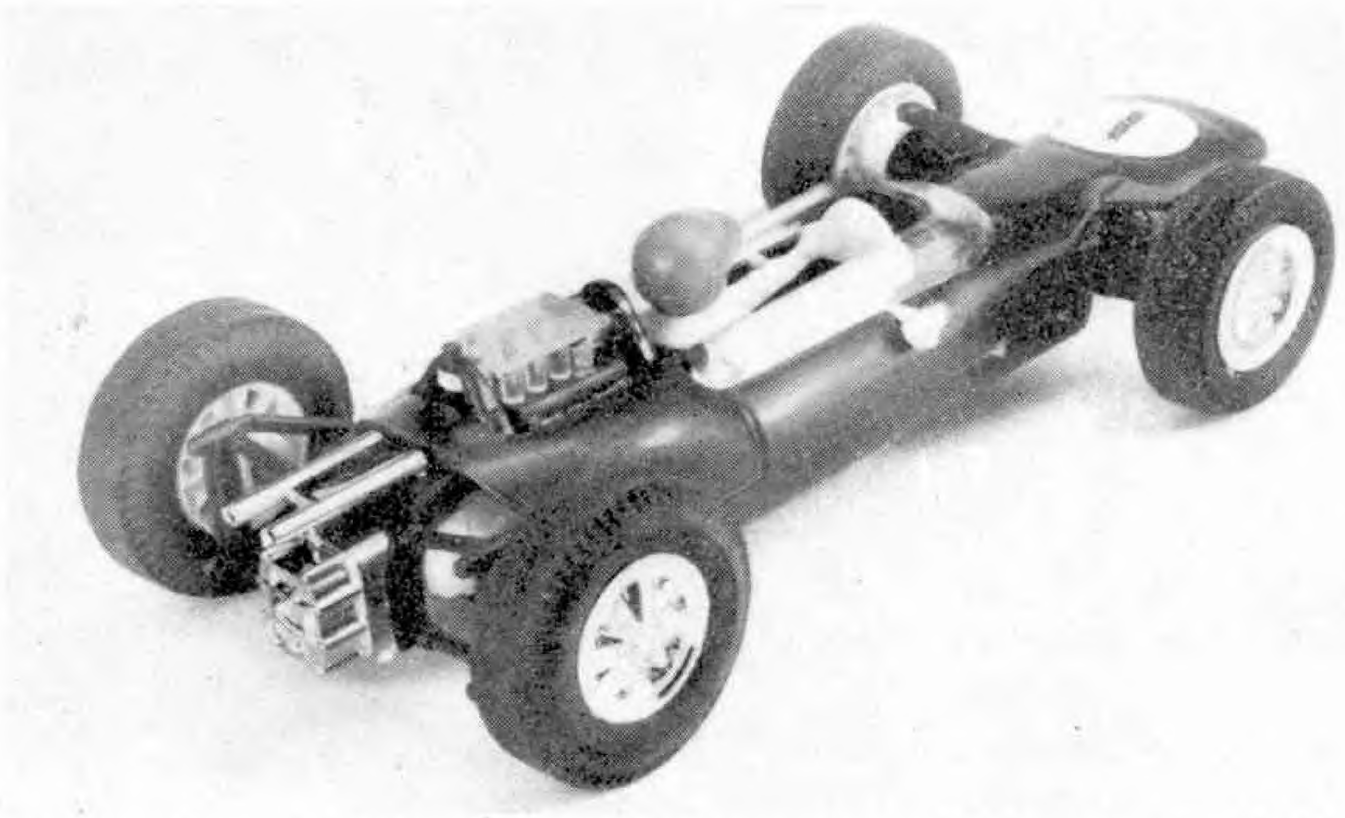
Race-tuned Specials

The only Outfit incorporating the Blow-out is Set '40' (£6 15s. 0d.), which also contains the two Cars numbered C/81 and C/82, in addition to the other standard items, but Set '70' (£9 15s. 0d.) includes a piece of equipment known as 'Twin Auto-Screams'. Sold separately under No. A/257 at £1 12s. 6d., this simulates the powerful engine noise of two high-speed racers in action. Each sound is controlled by a little gadget that can be fixed to one of the hand throttles. Cars packed in Set '70' are again numbered C/81 and C/82.

Sets '30' (£3 19s. 11d.) and '31' (£4 19s. 11d.) do not contain any of the items described above, but they do feature two Formula 1 Cars, which have not been previously mentioned, No. C/85 BRM and No. C/86 Porsche. Set '80' (£12 12s. 0d.), on the other hand, contains four previously-mentioned cars, two Lotus's and two Coopers as well as enough track to make a 4-lane layout. One Lotus is green and the other blue, while the Coopers are red and white, respectively.

The various cars packed with the Outfits do not, by any means, make up the full range of cars. Available separately are No. C/54 Lotus Grand Prix, No. C/68 Aston Martin GT, No. C/69 Ferrari GT and two vintage jobs No. C/64 Bentley 1929 and No. C/65 Alfa Romeo 1933. The Aston Martin and Ferrari come in a choice of two colours. Two Motor Cycle combinations B/1 and B/2 are marketed for motor cycle fans and there is also a Go-kart No. K/1 in the range.

Planned for later in the year, but illustrated in the catalogue, is a brand new series of 'Race-Tuned' cars, which are being specially introduced for the advanced Scalextric driver who needs more speed, instantaneous acceleration and perfect braking power. These high-speed models, however, must be used with a special 'Race-Tuned' hand controller No. A/262, which has been designed specifically for the series, and which incorporates a special braking device. Prices of the cars will range from 18s. 6d. to £1 9s. 6d.



Here's the business end of the latest Lotus. Lots of detail, yet sturdy enough for the rough and tumble of the track

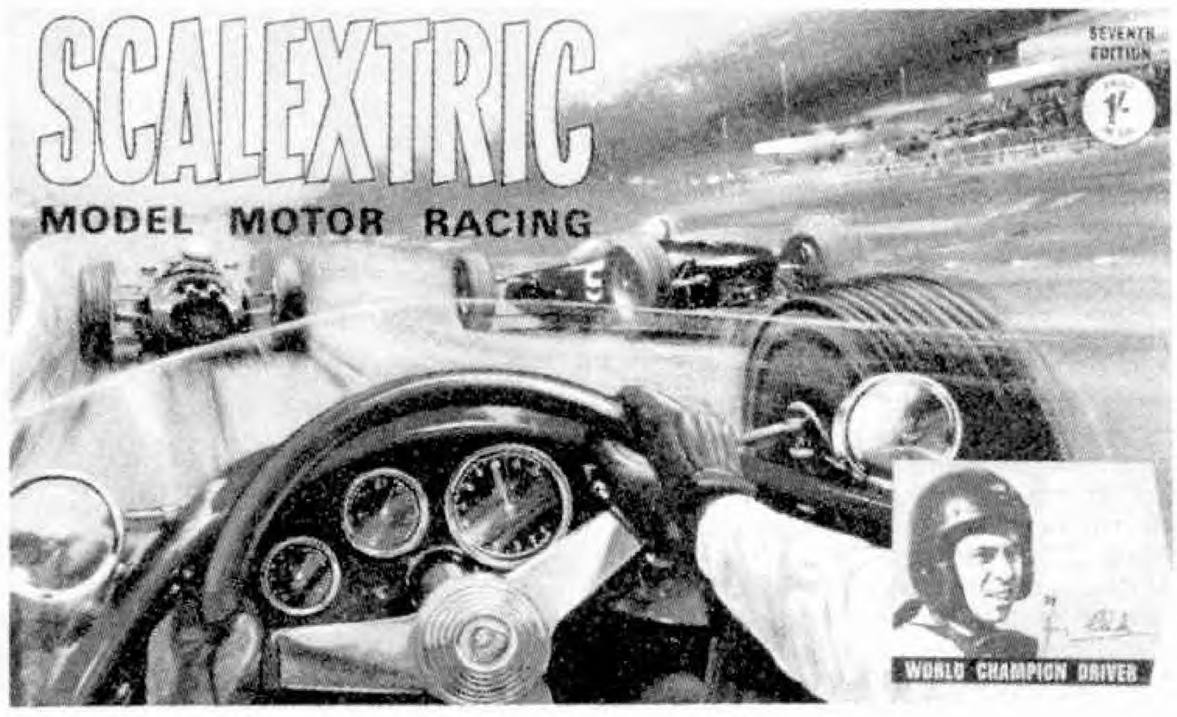
According to the catalogue the models which will be included in the 'Race-Tuned' range are as follows :

C/87 Vanwall, Grand Prix
C/88 Cooper, Grand Prix
C/89 BRM, Grand Prix
C/90 Ferrari, Grand Prix
C/93 Austin Healey Sports
C/94 Mercedes Sports
C/91 'D' Type Jaguar, Competition
C/92 Porsche, Competition
C/95 Bugatti, 1934 Vintage Grand Prix
C/96 Auto - Union, 1936 Vintage Grand Prix
C/77 Ford (Grand Touring)
C/78 A.C. Cobra (Sports)
C/79 Offenhauser (front engine)
C/80 Offenhauser (rear engine)
C/83 Sunbeam Tiger (Sports)
C/84 Triumph T.R.4A (Sports

Yet another brand new line is the pair of construct-it-yourself car kits, selling at £1 7s. 6d. Numbered CK/1 and CK/2, these kits come complete with everything, including a 'Race-Tuned' Motor and are based on the A.C. 'Cobra' Sports and the 'Porsche' 904 GTS. Two rear axle assemblies are provided, giving a choice of high or low ratio gearing. The main body parts are moulded in colour and the trim plated, so that there is no need to do any painting. I hope this range of cars will be extended in the future.

Already on sale is the particularly large range of Scalextric accessories including buildings, stands, officials, spectators, pit men, signs, fences, banking units, oil drums, hay bales, etc. There is even a working lighting kit for the buildings, and added enjoyment can be obtained from an accessory described as a Fuel Gauge No. A/245. To quote from the catalogue, 'This gauge represents the amount of fuel in a car's tank. The load of fuel that a car carries restricts its maximum performance, but as a race progresses and fuel is used up, the load gets lighter and the maximum speed of the car increases. When the tank is nearly empty, the car then goes its fastest —and, of course, when the tank is dry, it comes to a stop. For short races a "full tank" may not be necessary, while for longer races pit stops to "refuel" may have to be made'.

The catalogue, which will be on sale in a few weeks' time, is available only from Scalextric dealers, priced at 1s.



FAIR VIEWS

January and February are, by tradition, the months when the world's toy manufacturers present their latest catalogues and display their wares for the inspection of their customers. The British Toy Fair is held in Brighton and this year, we took our camera along. There was so much to see and photograph that it would need the whole of this issue to do justice to even the small section in which we were interested; So these three pages of Fair Views are merely a sample of the many exciting new toys and models, many of which we shall be dealing with more fully in forthcoming issues of Meccano Magazine.



1 Latest **Frog** 'Trailblazer' is the famous three-engined Fokker F VII 3M 'Southern Cross". In this historic machine, the Australian pioneer airman Kingsford Smith completed a global air network in 1928 by making the first 7,000 mile flight across the Pacific. This was only one of the many memorable achievements of this true 'Trailblazer'. The kit, complete with two finely sculpted standing figures and display stand costs 6s.

2 The **Airfix** 'Old Bill' bus in its familiar London Red has been a popular kit for some time now. But one of the most memorable of the many stories that surround this interesting vehicle is the way in which it was used during World War One to transport troops to the front line. 'Old Bill' is now to be kitted in this guise. With its boarded-up windows and drab green colour scheme authentically daubed with regimental names, this fine model—complete with soldiery—is in for a new lease of life at 12s 6d.

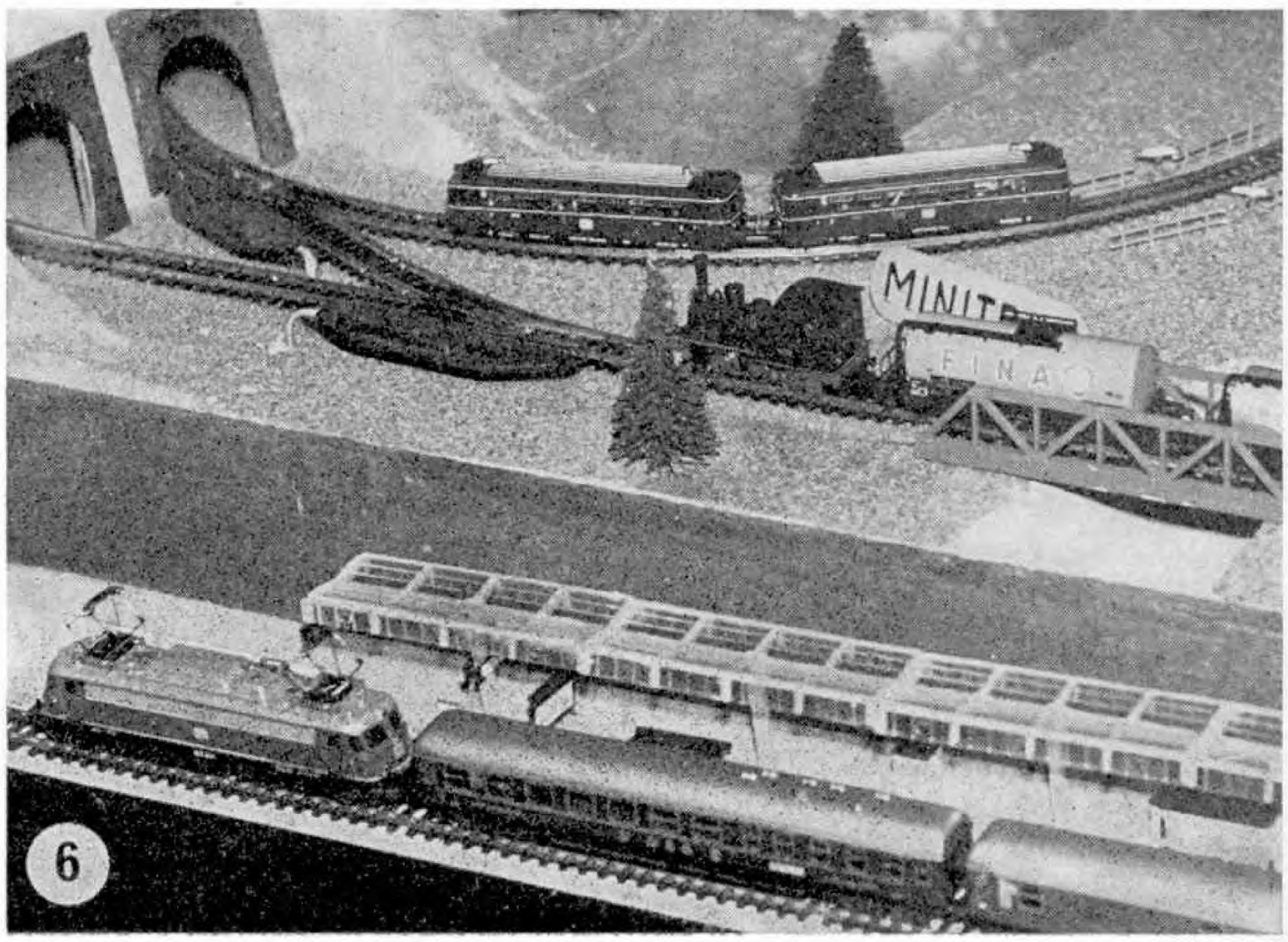
3 **Riko** have a fine selection of new imports including a really impressive kit for a slot racing Honda from Japan at 69s 11d, complete with motor. According to the importers, this is the first time that this model has been available anywhere in the world.

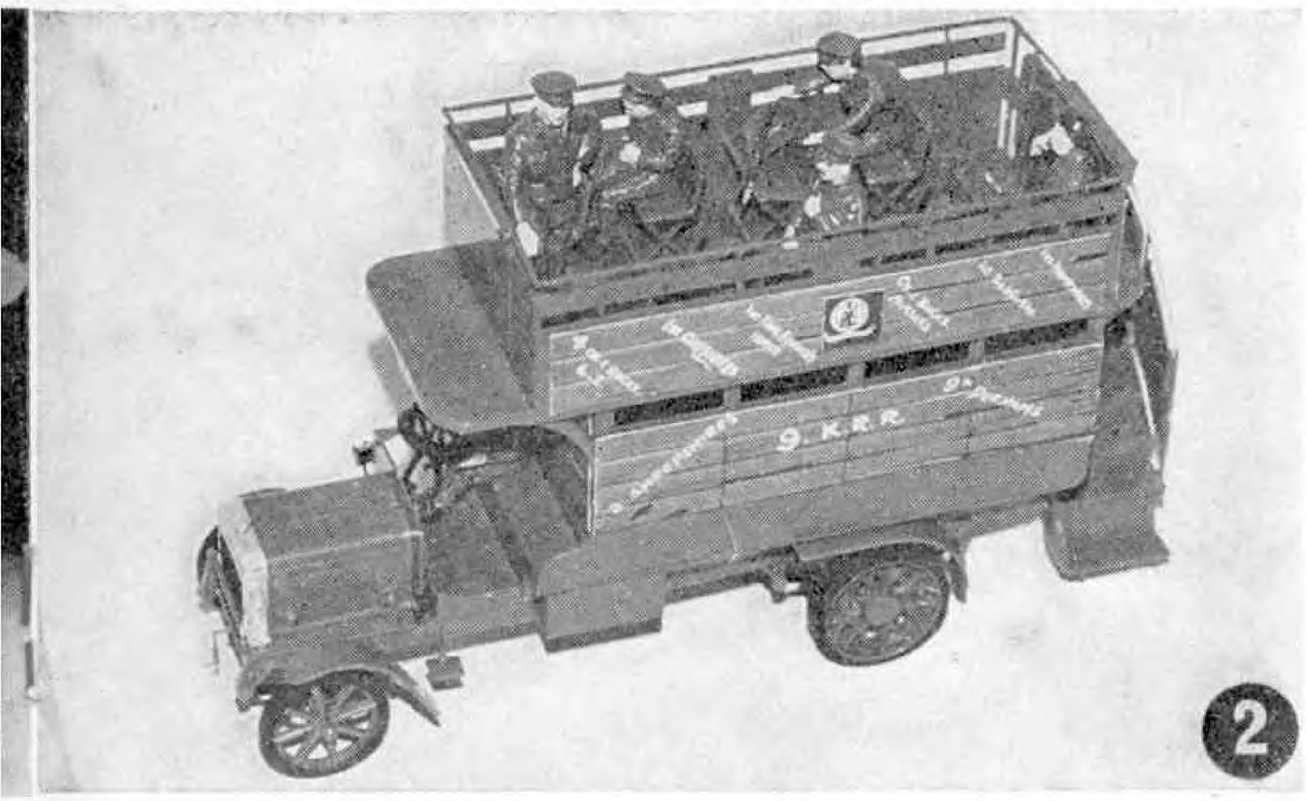
4 Project '66 builders will be interested in the latest **Futaba** radio control equipment which is highly reliable and most economically priced. Both superhet and superregen. gear is included in the range currently available and details are obtainable from, Contarnex Time and Control Ltd., 52/54 High Street, Croydon, Surrey.

5,8 The **Peco** display was just bursting with new items for the railway fan. N gauge has really arrived and Peco 'Wonderful Wagons' are starting to appear in this new scale. The first is a fine BP tank wagon complete with highly detailed underframe, anti-friction wheels and standard automatic couplings. N gauge large radius points and a crossing are also added to the track system and moulded foam ballast is available. For the Arnold 0234 chassis there's a beautiful new Hymek body kit that is sure to be a real winner. OO/HO 9 narrow gauge enthusiasts

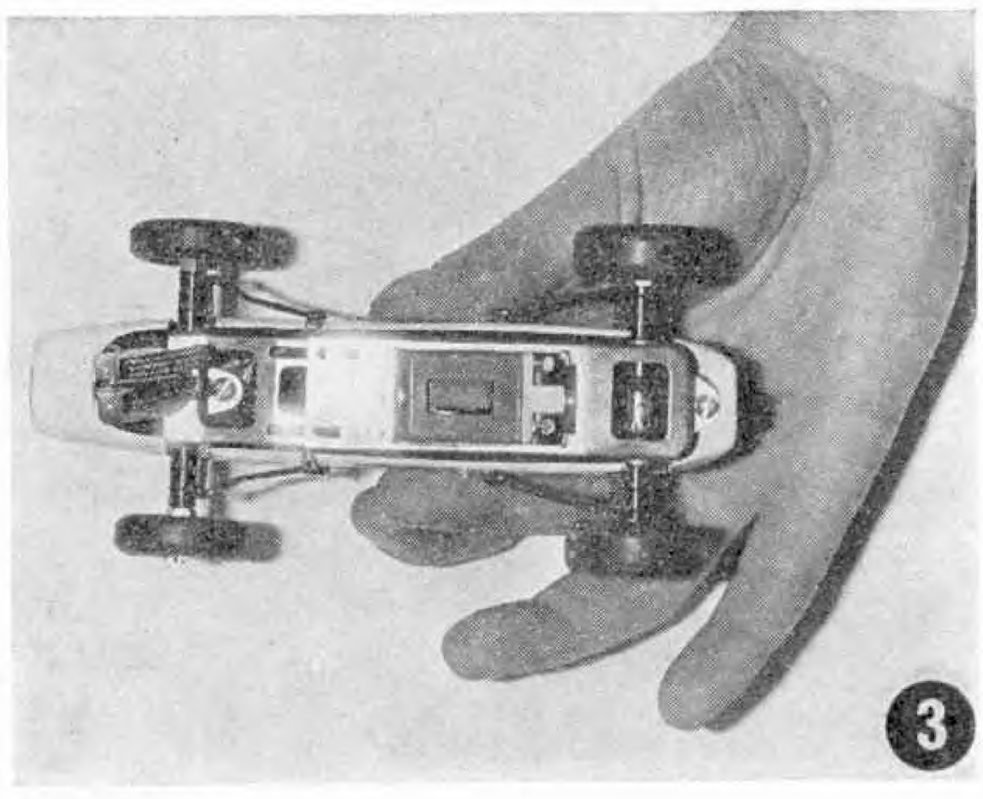




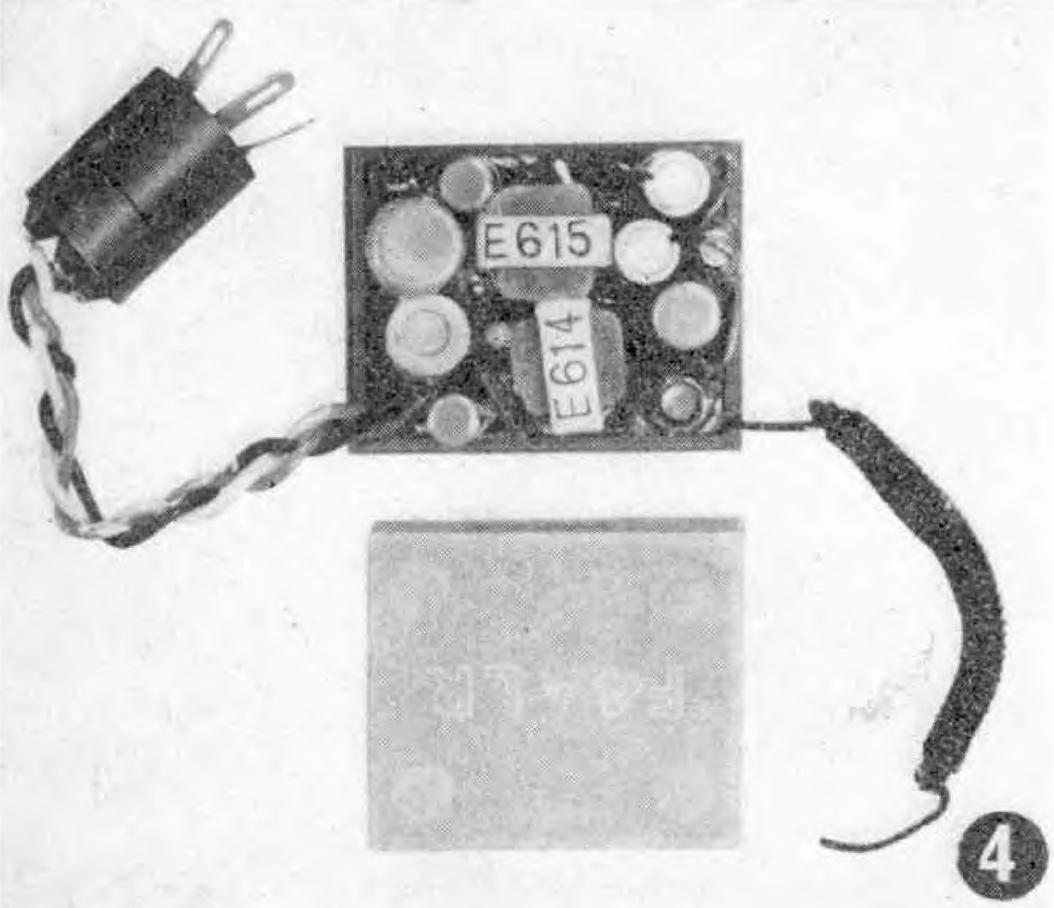




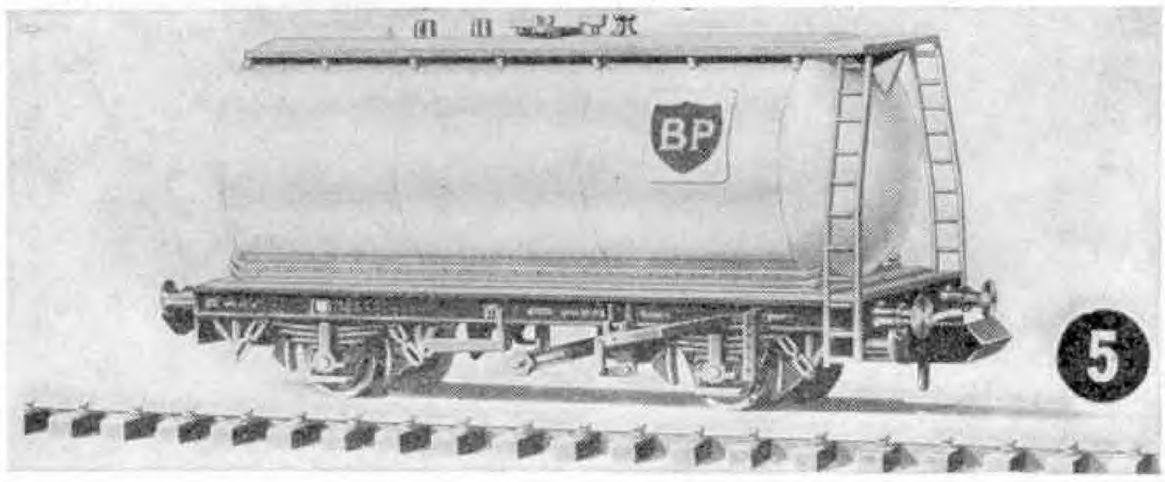
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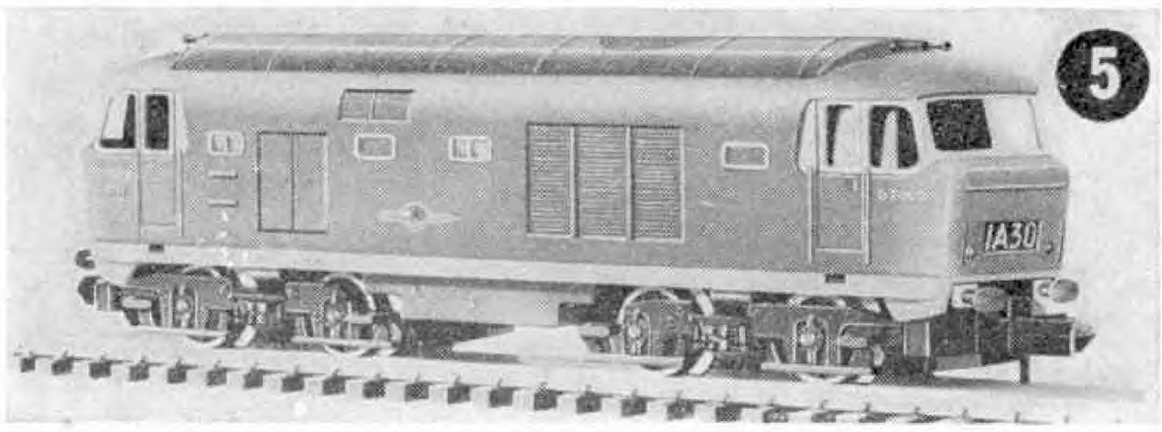
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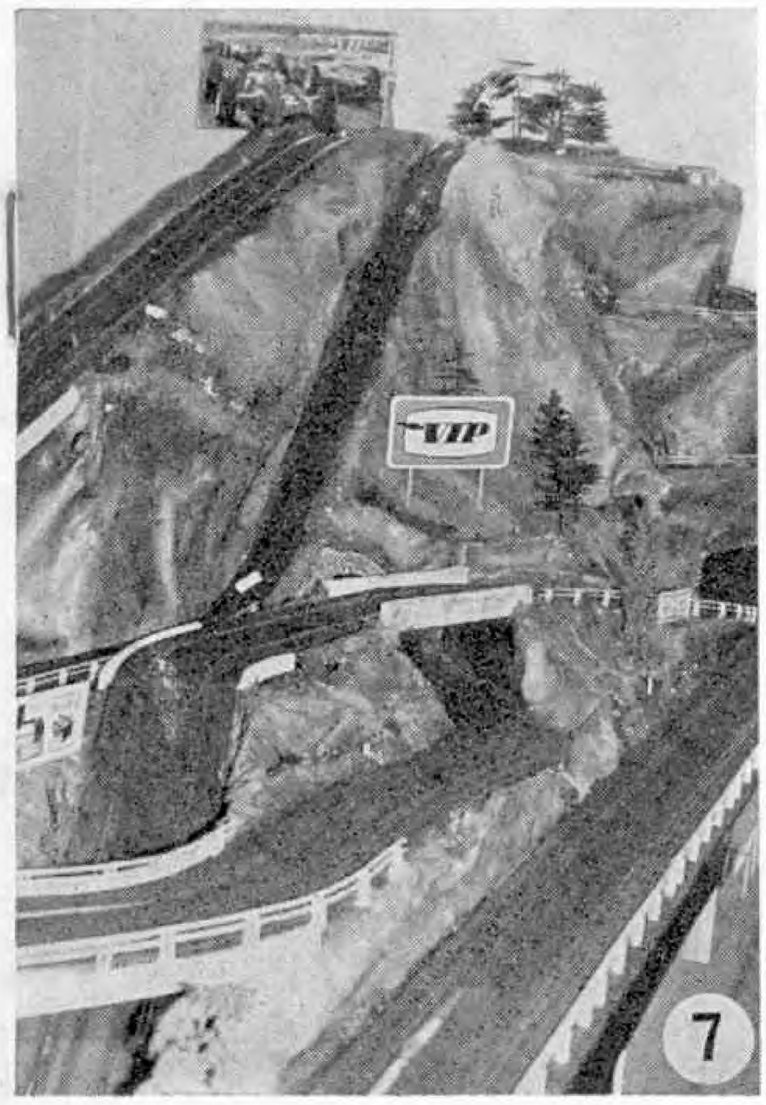
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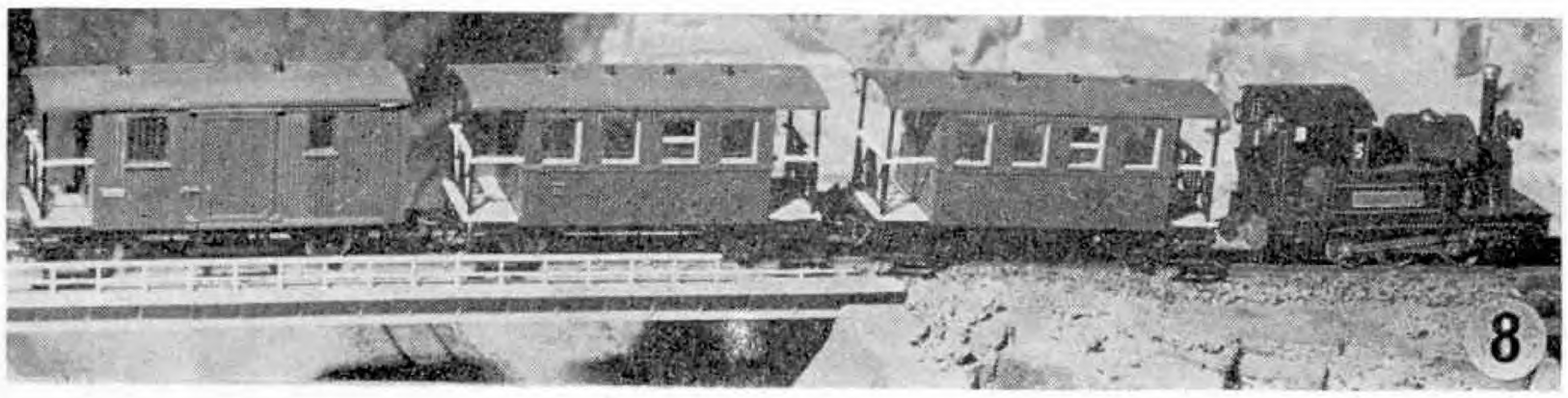
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8

will love the little Saddle Tank loco kit for the 0-6-0 Arnold chassis (Photo 8) and a complete narrow gauge track system makes this scale a practical proposition for the first time.

6 The **Mini–Trix** N gauge range is rapidly being expanded and some really exciting new products –are on their way. The Two-Car Diesel Rail Bus is quite beautiful and there is a class E 10 twin-pantograph electric Bo Bo locomotive with *working* pantographs! The true-scale length coaches that N gauge allows, makes the operation of main line expresses completely feasible in even modest areas.

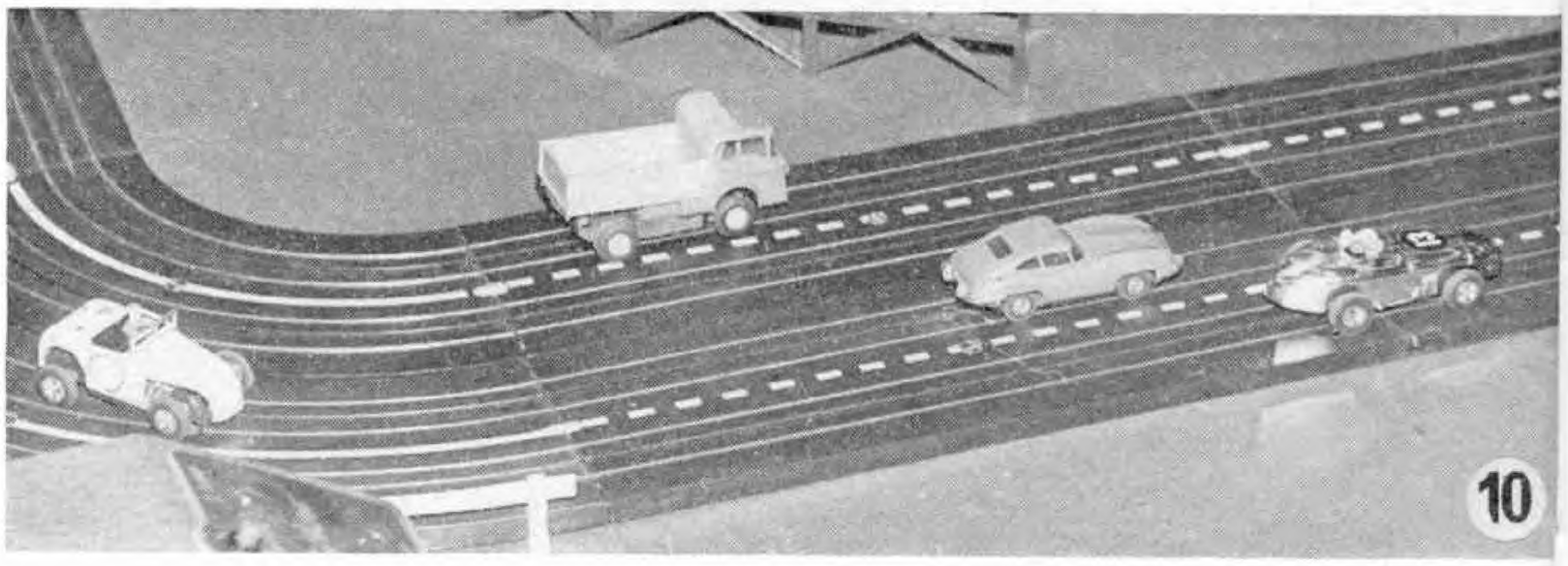
7 Most impressive scenic slot racing track at Brighton was that of **VIP.** Here were all the thrills of an alpine rally, the speed of a drag strip and the challenge of a one in one hill climb! The new VIP cars batted round all day with a most impressive silent efficiency.

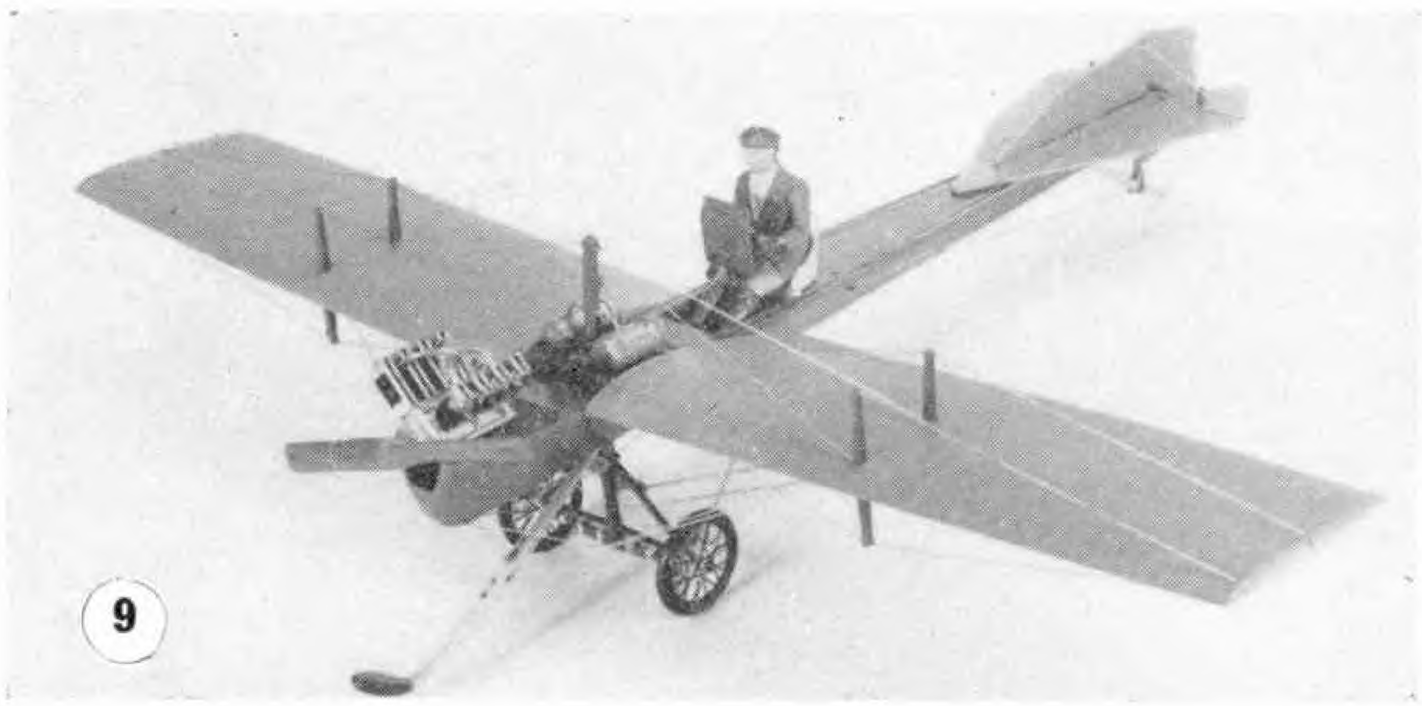
9 A new name in the plastic kit field is **Inpact** and their first three models of early aeroplanes to 1/48th scale are really most impressive. Our picture shows a Martin Handasyde and the other two kits are for a Bleriot and a Deperdussin. These will shortly be followed by an Avro Biplane, an Avro Triplane and a Bristol Boxkite. The detail in these models is very complete including textured surfaces, full engine fittings, simulated spoked wheels and really life-like pilots. Those of you who have seen the film 'Those Magnificent Men in Their Flying Machines' will recognise many of these names, and you will certainly want to add the models to your collection. Price is a very modest 5s 6d each.

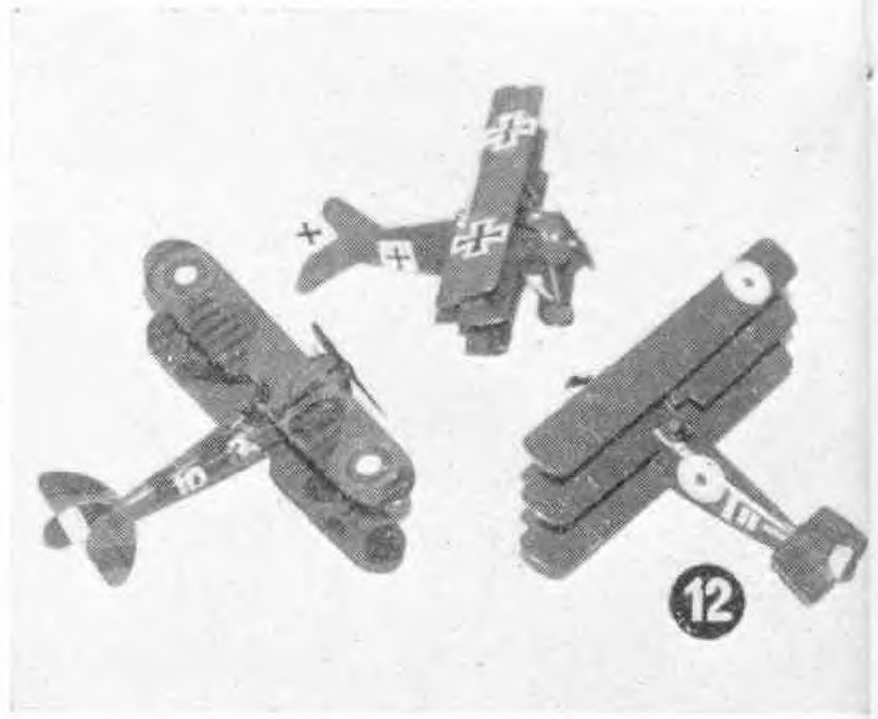
10 **Aurora** Model Motoring has arrived! Model Hobby Products Ltd., of 282 Chase Road, London, N.14, are bringing this fine system over from the U.S.A. where it has gained a fine

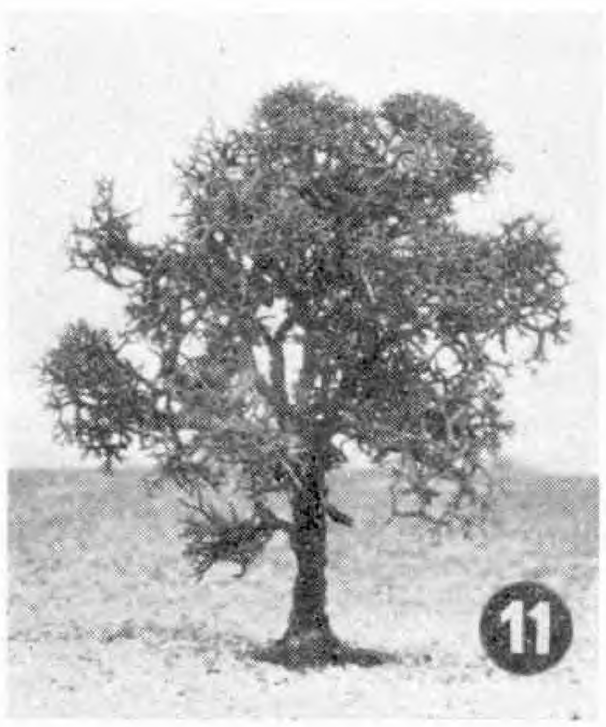
reputation for its realism and reliability. The motors in these cars are quite revolutionary and confer upon them a sparkling performance. Size is such that a really comprehensive track can be operated in quite a small area and the variety of vehicles available, from trucks to stock cars is certain to make Aurora a track to watch in the coming year.

11 Trees always present the modeller with a problem when it comes to reproducing them in miniature. The problem is now solved! Continental Models of 4 Castle Street, Clitheroe, Lancs., are importing the *Noch* tree kits and as you can see from our picture, they are indeed realistic. They are easy and fascinating to make up and cost 3s 11d per set of three trees. Various types are available.











12 **Revell** have a big production programme for 1966. Aircraft, cars, ships—they're all catered for and are fully detailed and illustrated in the Revell '1966 New Releases' folder. Our photo shows the three new World War One 2s 1/72nd scale aircraft models—a Neiuport 28, Fokker D1, and Sopwith Triplane. Other random selections from the programme include a Gemini Space Capsule, Golden Hind, Honda motor bike, Sherman tank, Heinkel 219, Lockheed YF-12A, and a whole host of new slot racing cars and accessories.

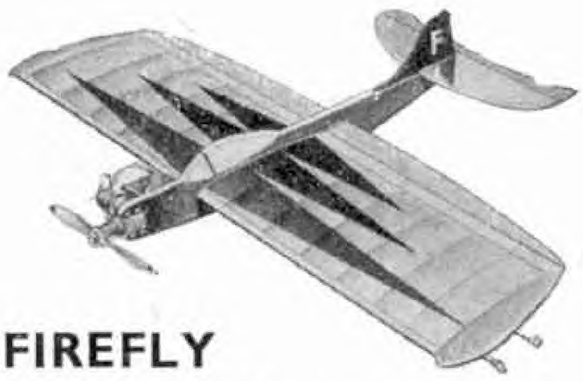
13 **Impy Cars** at 2s 11d each are masterpieces of the toymakers' art with opening doors, boots and bonnets. Now you can have a garage for them complete with roof car park, inspection ramp and showrooms. This realistic model costs 22s 6d.

14 **Jetex** kits and motors are now being distributed by Hobbies Ltd., and new items are soon to be added to the range. The first two are a Hydroplane at 12s 6d and a Jetcar at 17s 6d. Both are powered with the powerful little Jetex 50 unit.



START OFF RIGHT with a KEILKRAFT model aircraft kit!





FIREFLY

Stunt model with "profile" type fuselage, specially designed for engines under 1 c.c. Kit contains die-cut parts. Wingspan 20 in. **19/9**



PHANTOM MITE

Just about the toughest model available to the newcomer to control line flying. Features all sheet construction with wings, tailplane and fuselage sides ready cut to shape. Suitable for .5 to .8 c.c. motors. Wingspan 16 in. **17/9**

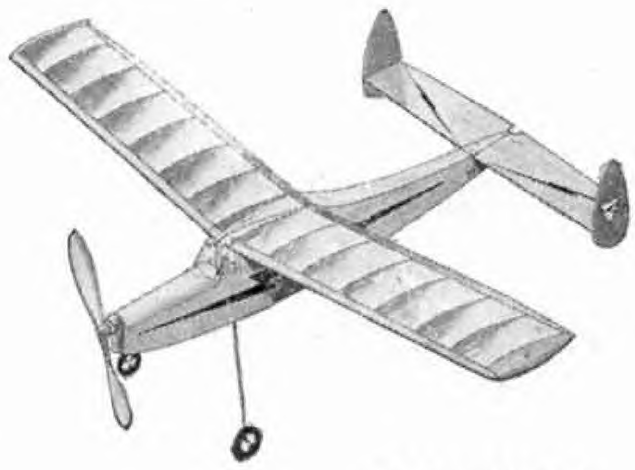


DEMON

Class A team racer to the new S.M.A.E. specification. Kit contains die-cut parts. For engines up to 2.5 c.c. Wingspan 30 in. **36/3**

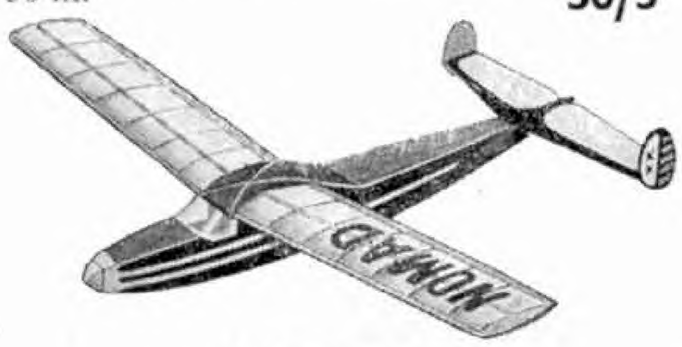
PHANTOM

Featuring all sheet construction for long life and easy repairs. A very steady performer for engines from 1 to 2 c.c. Contains ready shaped parts as in the Phantom Mite kit. Wingspan 21 in. **29/8**



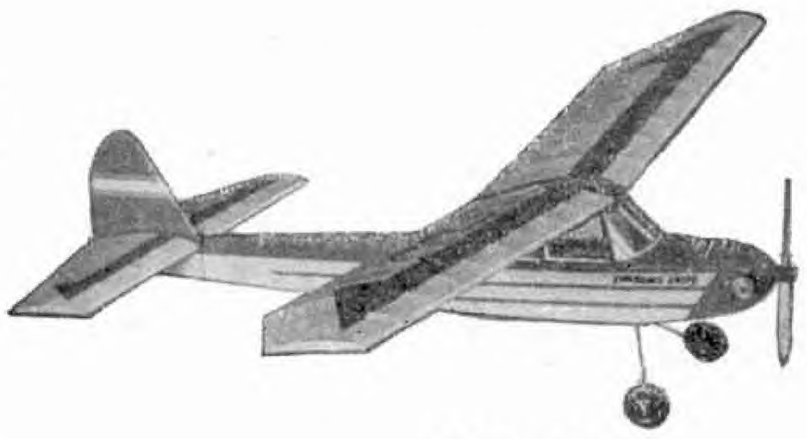
GEMINI

Duration model with all fuselage parts, tailplane, and fins in pre-cut, pre-decorated sheet balsa. Wingspan 22 in. **10/-**



NOMAD

Beginner's model with fuselage parts, tailplane and fins in pre-cut, decorated sheet balsa. 20 in. span. **5/11**



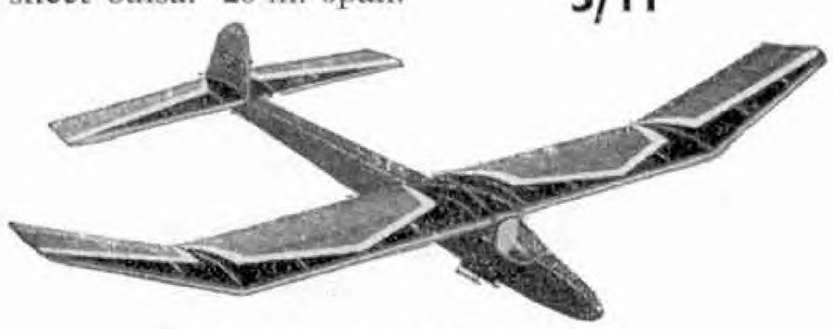
SNIPE

This nice looking model is especially suitable for beginners as it is so straightforward to build and easy to fly. Kit contains die-cut parts and has been specially designed for .5 diesel and .8 glow motors. Wingspan 40 in. **24/3**



ROBIN

Duration model with good flying performance. Kit features die-cut parts, plastic propeller and wheels. An ideal "first" model. Wingspan 22 in. **10/7**



CONQUEST

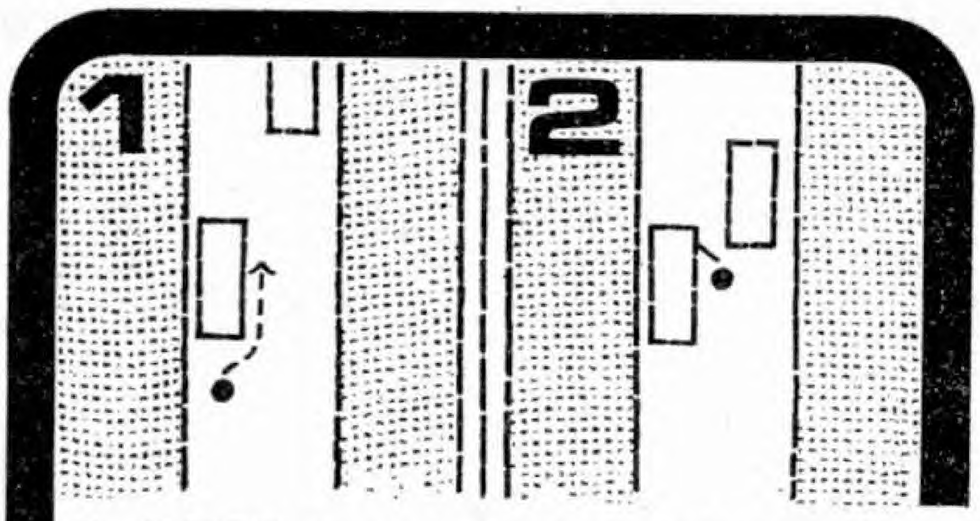
Towline glider for beginners, with a very good performance. Kit contains die-cut parts. Wingspan 30 in. **9/4**

All these Keilkraft kits contain die-cut parts for speedy, accurate assembly, and full size plans plus building and flying instructions.

KEILKRAFT

RIGHT from the start!

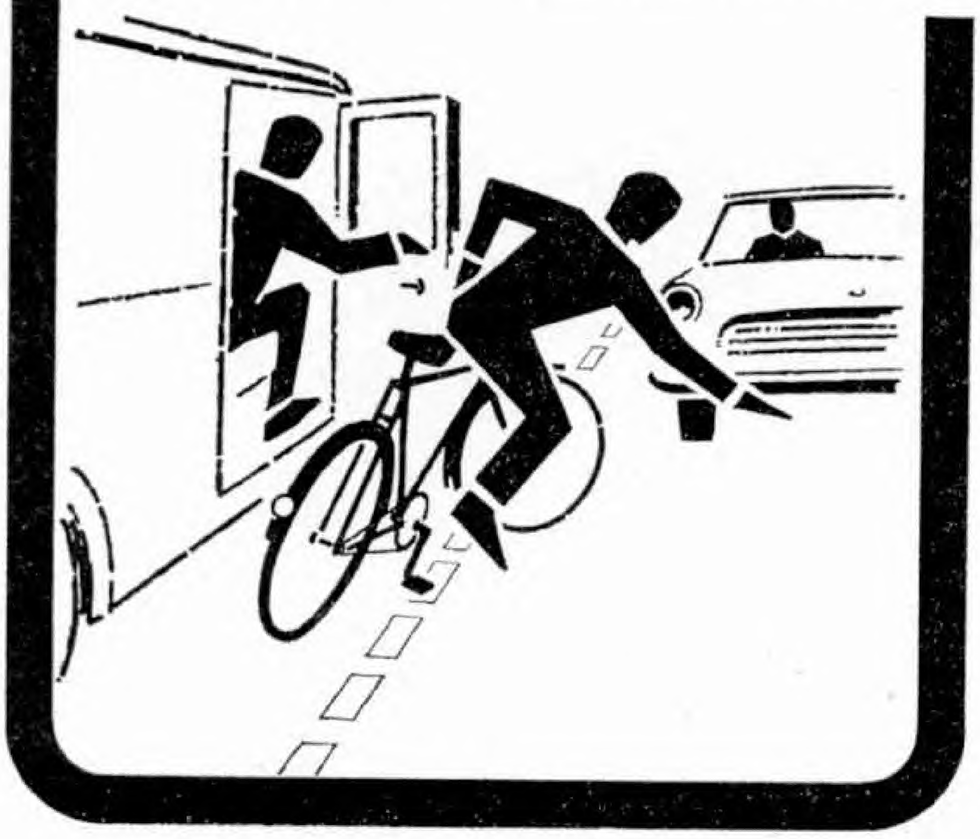
See this famous range at the local model shop



1 Overtaking a stationary vehicle in a narrow street deserves extra care, especially if there is another vehicle approaching you from the opposite direction, preventing you from making a wide, safe circuit. Remember, the driver of the stationary vehicle may well fail to see you in his rear mirror.

2 He might open his off-side door in your path, either causing you to crash, or making you swerve out in front of the oncoming vehicle. The answer—do *not* attempt to pass under such circumstances. Wait until the moving vehicle has passed, and then give the stationary one a wide berth.

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Set your sights high — and get the Best . . . a B S A Meteor Air Rifle. You'll be the envy of your friends with this "power packed" model. These are some of its features: super speed trigger release mechanism — a crisp light trigger action which can be adjusted to suit YOU . . . positive re-location of the barrel after each loading ensures the same zero is held from shot to shot . . . beautifully made stock and the whole rifle perfectly balanced. Boy! what a model to aim for — and to aim with!

BSA Mk. IV Telescope 4 x 20 made in Japan to BSA specifications

BSA Meteor Air Rifle with Mk. III 3 x 15 or Mk. IV 4 x 20 telescope

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BSA

40 GUINEAS TO BE WON

FOR YOUR MECCANO MODELS

JUST about every year since Meccano Magazine was first published we have held at least one Meccano Model-Building Competition and this, our Golden Jubilee Year, is certainly no exception. The latest contest, in fact, is now open for entries, so if you own a Meccano Outfit get down to some serious designing right away!

Open to all

As usual, the competition is open to every owner of a Meccano Set living anywhere in the world and no limit, maximum or minimum, is set on either the number of parts which may be used, or the number of entries which may be submitted. Any kind of model is eligible for entry, except those taken direct from a Meccano Book of Instructions; but it is important to remember that the more original the model, the better are your chances of success. Cash prizes will be awarded for what, in the judges' opinion, are the best-built models with special consideration being given to those in which the more unusual parts are put to good use. The contest closes on June 30, 1966, for competitors in the U.K. and Ireland and two weeks later, on July 14, for overseas competitors.

Entries will be divided into two sections, A and B. Section A is for competitors under 14 years of age on the closing date and section B for competitors aged 14 or over on that date. Prizes in these sections are as follows: Section A, 1st £5 5s. 0d.; 2nd £3 3s. 0d.; 3rd £2 2s. 0d.; ten prizes of 10s. 6d. Section B, 1st £7 7s. 0d.; 2nd £5 5s. 0d.; 3rd £3 3s. 0d.; ten prizes of £1 1s. 0d.

How to enter

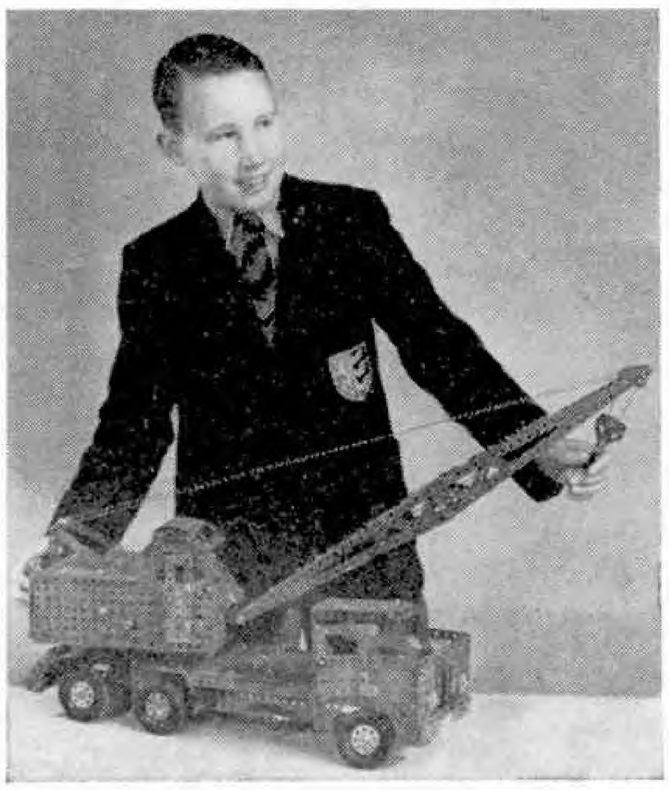
Once you have built the model, obtain a good clear photograph of it or, failing this, a reasonably detailed sketch. If art is not your strong-point, then it is quite permissible to have a friend sketch it for you, but the model itself must be your own un-aided work. It is also advisable to submit a short description of the main features, mentioning any points of interest that you would like brought to the attention of the judges, particularly the uses of any unusual parts. *Under no circumstances, however, must the actual model be sent.*

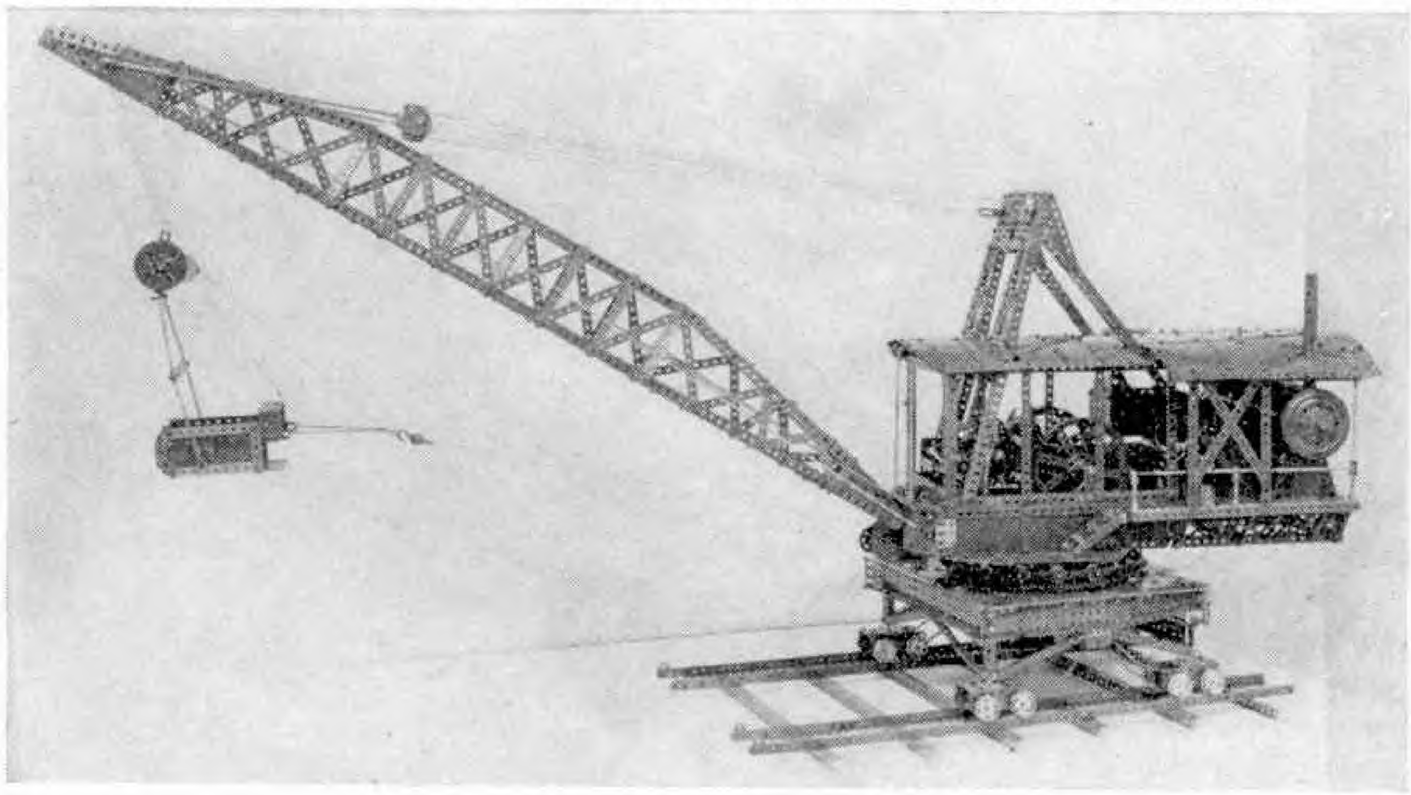
In entering the contest, write your name and address on the back of each photograph or drawing, together with the letter A or B (according to the section in which you qualify), and forward to: Model-Building Contest '66, Meccano Ltd., Binns Road, Liverpool 13. Prizewinning entries become the property of Meccano Ltd., but unsuccessful attempts will be returned if accompanied by a suitable stamped addressed envelope or, in the case of overseas entries, a self-addressed envelope and appropriate International Reply Coupons.

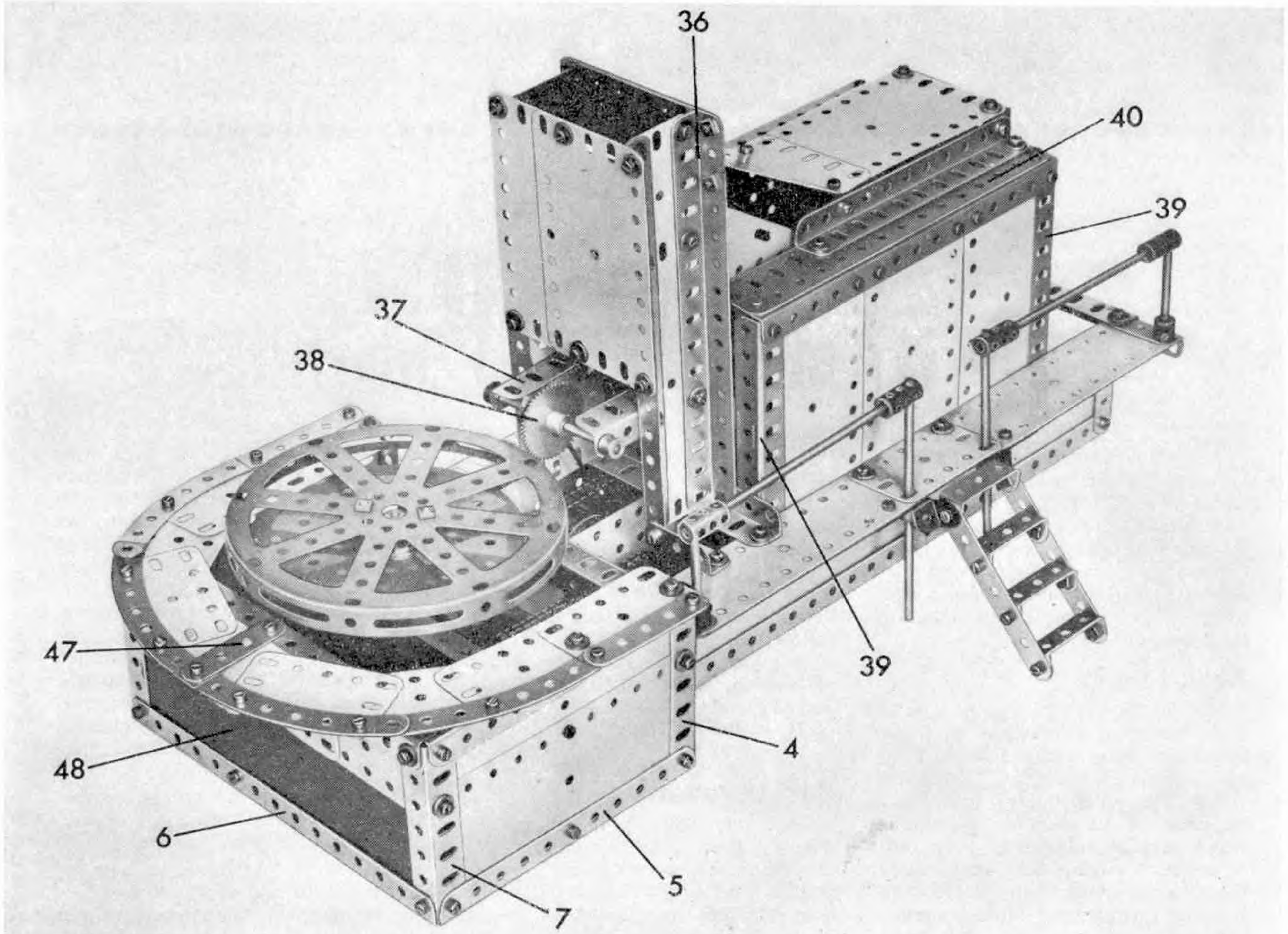
The Company will not be responsible for any entry damaged or lost, and the judges' decisions are final.

We believe that the conditions for entry are fair and very easy, yet it is surprising how many entrants for past competitions have not given all the details required on the back of their entries. Most common fault has been to omit the section letter (A or B), which could mean disqualification, so *please pay special attention to this point.* It is best to double-check *everything* before finally sealing and posting your entry. Good luck!

Examples of models which have won prizes in past competitions, right a rail-mounted Giant Dragline Excavator, left, a sturdy Lorry-mounted Crane

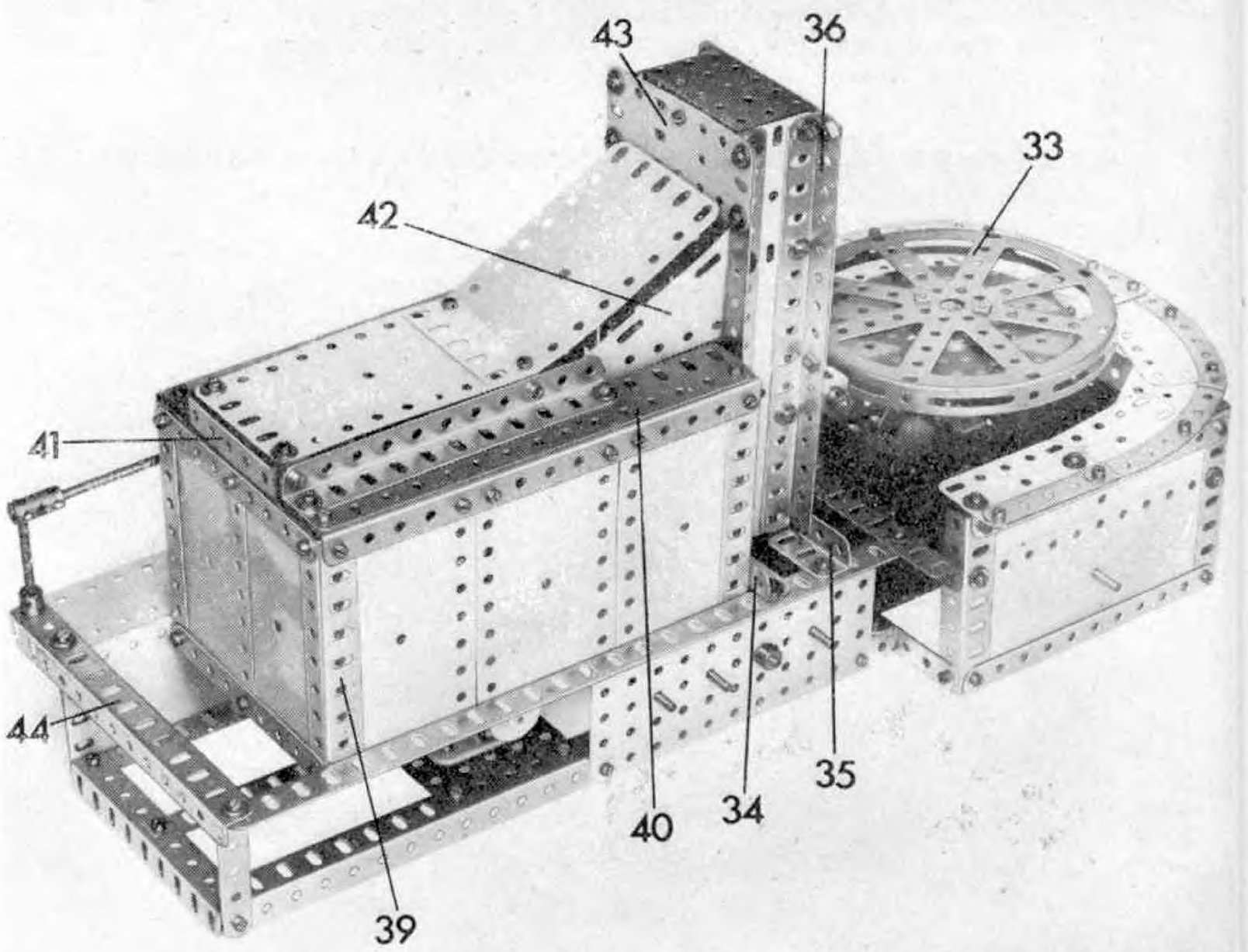


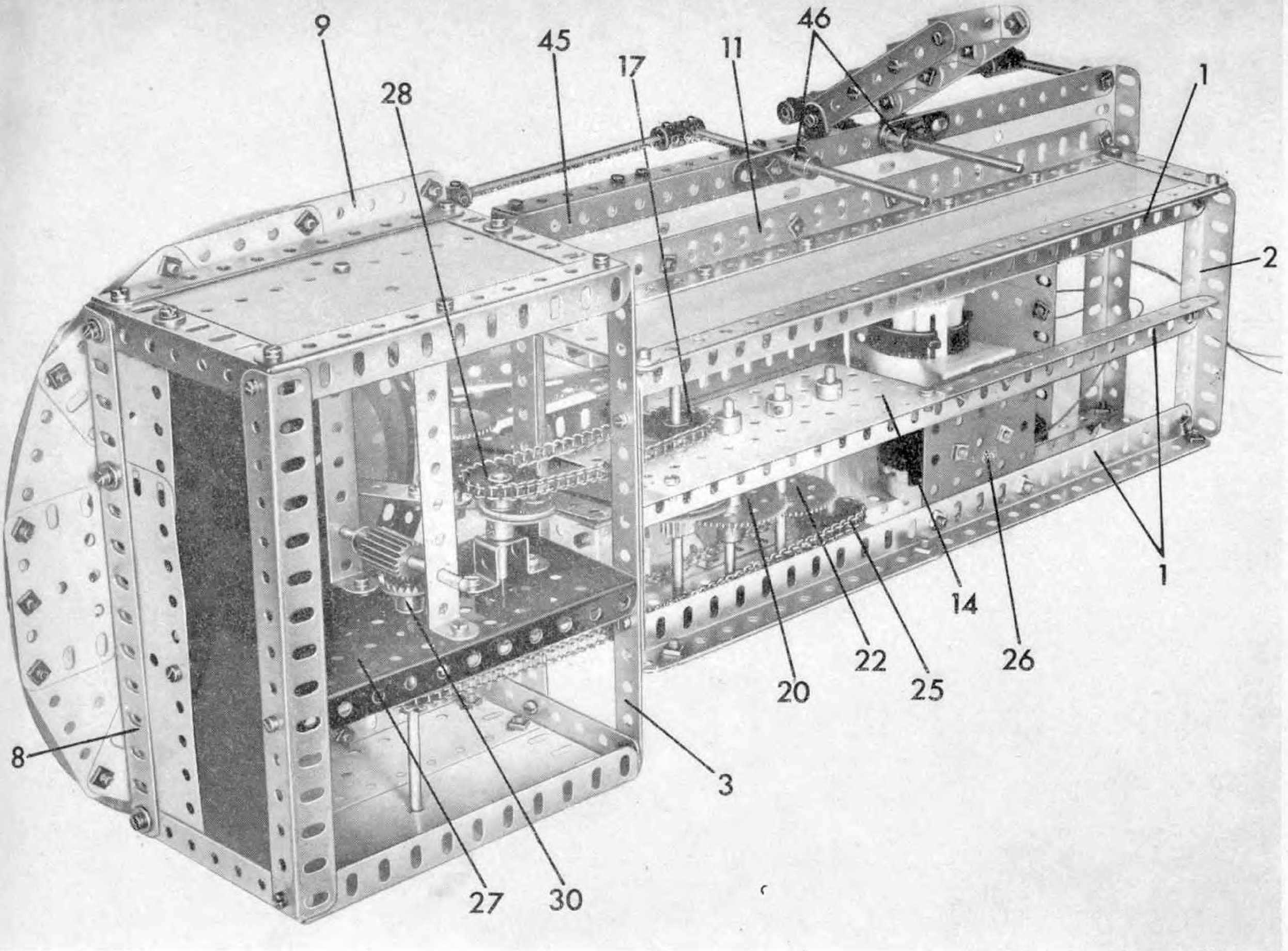




Spanner builds a Meccano Gear-cutting machine

IT'S GEAR!





AS I have often said, working models of almost every piece of real-life mechanical apparatus can be produced in Meccano. Indeed, we have featured thousands of examples, ourselves, in the 'M.M.', but one which I do not ever remember seeing before is this month's advanced construction — a Gear-Cutting Machine.

Gears, of course, are produced in hundreds of different sizes, and not all of them, by any means, are cut on the same machine. The prototype on which our model is based, in fact, turns out the 'monster' parts often used in huge plant machinery and hydro-electric generating stations, etc.

The basic actions of the machine are reproduced in our model. The gear to be cut is fixed on the circular work table which then moves up and down while the cutting tool shapes one tooth. When completed, the work table automatically revolves a short distance and again moves up and down until the second tooth is cut, and so on.

When constructing the model, it is best to first build the main framework before completing the less-important 'superstructure'. Three 12½ in. Angle Girders 1 are connected at each end by a 4½ in. Angle Girder 2, one of which is extended by a 7½ in. Strip 3. Bolted to the ends of Strip 3 is a 3½ in. Angle Girder 4, to which a 5½ in. Angle Girder 5 is fixed. Girders 5 are then joined by a 7½ in. Angle Girder 6, at the same time bolting another two 3½ in. Angle Girders 7 in place. At their upper ends Girders 4 and 7 are joined on three sides by one 7½ in. Angle Girder 8 and two 5½ in. Angle Girders 9, while lower down on the fourth side, Girders 4 are joined by another 7½ in. Angle Girder 10.

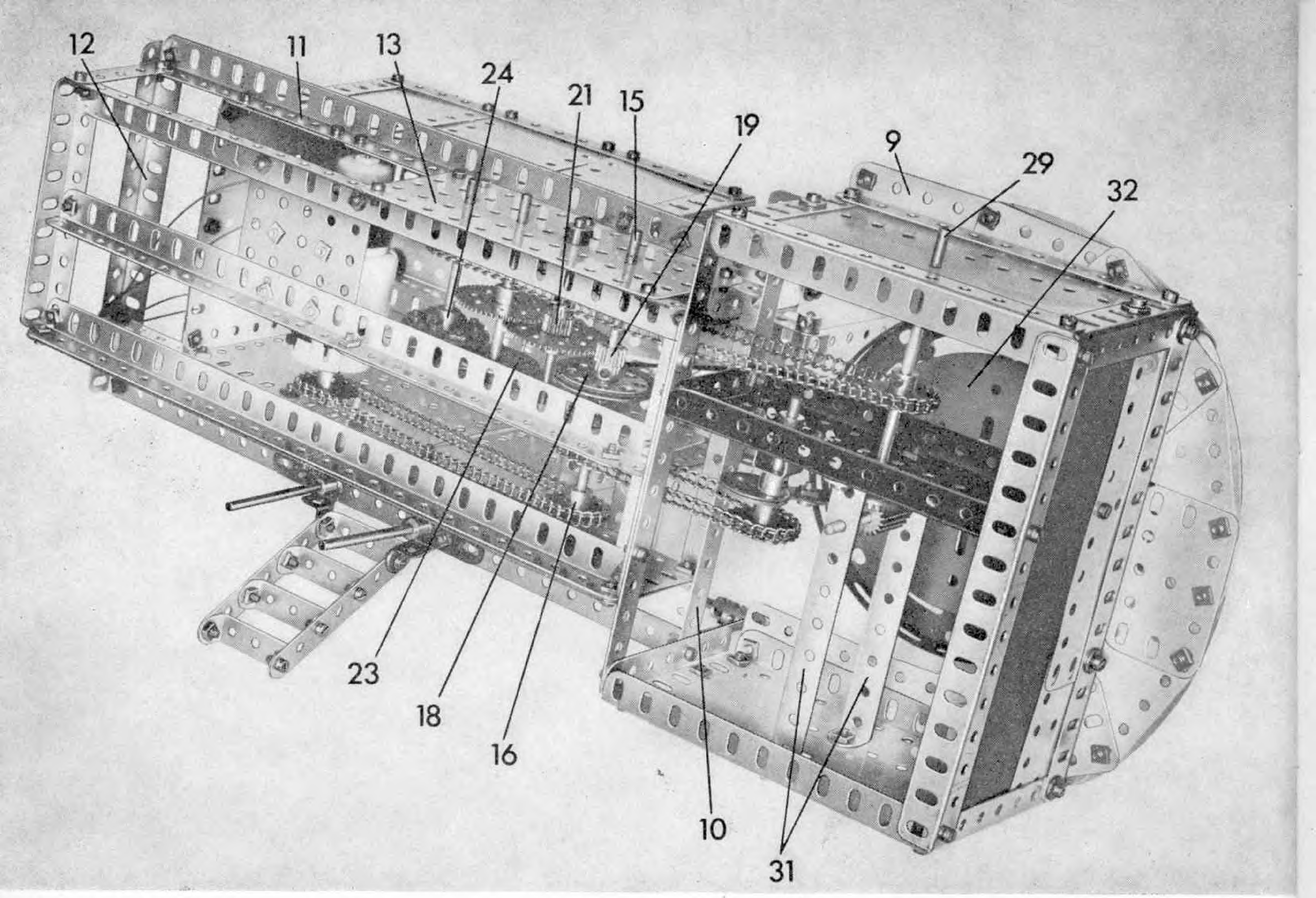
Fixed to Angle Girder 10 are two 12½ in. Angle Girders 11, connected by a 5½ in. Angle Girder 12 and joined to Angle Girders 1 on one side by 2½ in. Strips and on the other side by a 5½ in. by 2½ in. Flat Plate 13 and a 2½ in. Strip. Another 5½ in. by 2½ in. Flat Plate 14 is bolted to the centre Angle Girder 1.

Journalled in Flat Plates 13 and 14 is a 5 in. Rod 15, carrying two 1 in. Sprocket Wheels 16 and 17, a 1½ in. Pulley 18 and a $\frac{7}{16}$ in. Pinion 19. Pinion 19 is in mesh with a 60-teeth Gear Wheel 20 on a 3½ in. Rod held in the Flat Plates by Collars. Also mounted on this Rod is a second $\frac{7}{16}$ in. Pinion 21 in mesh with a second 60-teeth Gear Wheel 22 on another 3½ in. Rod, which also carries an eight-hole Bush Wheel 23, that has a Nut and Bolt fixed in one of the holes. A second eight-hole Bush Wheel 24 on a 3½ in. Rod has a Nut and Bolt fixed in all eight holes, and this is positioned on the Rod so that, with each revolution of Bush Wheel 23, the single Bolt catches each of the eight Bolts in turn, thus causing Bush Wheel 24 to revolve intermittently. A 1 in. Sprocket Wheel 25 is also mounted on the last Rod.

A 2½ in. by 2½ in. Flat Plate 26 is bolted between two Angle Girders 1, at the same time fixing a Power Drive Unit in position. A 1 in. Sprocket Wheel on the output shaft of this Unit is connected to Sprocket Wheel 16 by Chain.

Bolted to Angle Girders 6 and 10 and to Strip 3 is a 5½ in. by 2½ in. Flanged Plate 27, to which a Double Bent Strip is secured. A 2 in. Rod, journalled in this Double Bent Strip and the Plate, carries a 1 in. Sprocket Wheel 28 and a single-throw Eccentric. Sprocket Wheel 28 is connected to Sprocket Wheel 17 by Chain. Also, Sprocket Wheel 25 is connected by Chain to another 1 in. Sprocket Wheel on a 4 in. Rod 29, journalled in Flanged Plate 27 and a 5½ in. by 2½ in. Flexible Plate, bolted to Angle Girders 4 and 7 at one side. The Rod is held in place by a ¾ in. Contrate Wheel 30.

A 5½ in. by 1½ in. Flexible Plate is also



bolted between Girders 4 and 7 at the side in question, while a 5½ in. by 2½ in. and another 5½ in. by 1½ in. Flexible Plate is bolted between Girders 4 and 7 at the opposite side. Secured between these Plates and Flanged Plate 27 are two 4½ in. by ½ in. Double Angle Strips 31, in which a 4½ in. Rod is mounted. This Rod carries a ½ in. Pinion with a ¾ in. face in mesh with Contrate 30, three Collars and an eight-hole Bush Wheel, to which a 4 in. Circular Plate 32 is fixed by two ½ in. Bolts, the shanks of the Bolts pointing upwards. A Collar is then fixed on the shank of each Bolt, after which a Hub Disc 33 is fixed in place by Nuts. This Hub Disc represents the gear to be cut.

A ⅜ in. Bolt is held in one transverse tapped bore of the Collar immediately below the Circular Plate by a Nut. Loose on the shank of this Bolt is a 3 in. Strip that is bolted to the arm of the above-mentioned Single Throw Eccentric.

Attached between Angle Girders 11 is a 5½ in. Angle Girder 34, and separated from this by a distance of one hole are two 1½ in. Angle Girders 35, bolted one to each Girder 11. Bolted to Angle Girders 35, in turn, are two 7½ in. Angle Girders 36, while another two corresponding Angle Girders are fixed to Girder 34. The intervening space is then enclosed at each side by a 5½ in. by 1½ in. and a 2½ in. by 1½ in. Flexible Plate, at the same time bolting a 2½ in. Angle Girder 37 in position. A 3 in. Rod, carrying a 50-teeth Gear 38 and a ½ in. fixed Pulley, is held in Girders 37 by Collars. The Pulley is connected to Pulley 18 by a Driving Band, and Gear 38, incidentally, represents the actual cutting tool.

Four 4½ in. Angle Girders 39 are bolted to Girders 11, being joined at the top by two 7½ in. Angle Girders each overlayed by a 7½ in. Flat Girder 40. Each side is then filled in by three 4½ in. by 2½ in. Flexible Plates, and the back by two 4½ in. by 2½ in. Flexible Plates, edged at the top and bottom by a 4½ in. Strip. Two 5½ in. Angle Brackets, connected by a 2½ in. by ½ in. Double Angle Strip 41, are fixed to Flat Girders 40, and the top is then covered by another two 4½ in. by 2½ in. Flexible Plates, attached to the Angle Girders by Angle Brackets. The forward Plate is bent upwards, the resulting space at each side being enclosed by a 3½ in. by 2 in. Triangular Flexible Plate 42, bolted to the respective Angle Girder 35.

The space between front Angle Girders 35 is filled in by two 4½ in. by 2½ in. Flexible Plates, while rear Girders 35 are joined by a 3½ in. by 1½ in. compound Flexible Plate 43 made up from two 2½ in. by 1½ in. Flexible Plates. A 2½ in. by 1½ in. Flanged Plate encloses the top.

At the back of the model, Girder 12 is extended by a 1½ in. Angle Girder 44 which is then connected to Girder 10 by a 12½ in. by 1½ in. compound Flexible Plate, obtained from a 2½ in. by 1½ in. and two 5½ in. by 1½ in. Flexible Plates. This compound plate is edged on its underside by a 12½ in. Strip 45, fixed in place by a Rod Socket at each end. Two-inch Rods are mounted in the Rod Sockets and these are extended, via Couplings, by 4½ in. Rods. At their other ends, these Rods are connected, again via Couplings, to 5 in. Rods held in Cranks 46 fixed to Strip 45. A ladder is built up from two 3½ in. Strips joined by four 1½ in. by ½ in. Double Angle Strips, and it is secured to Strip 45 by Corner Angle Brackets.

A platform is built round the 'gear' from nine 2½ in. by 1½ in. Flexible Plates edged by four 4 in. Stepped Curved Strips and two 2½ in. Strips. A 2 in. Strip 47 is added for strength and, finally, the front of the model is completed with a 7½ in. Strip Plate 48, a 5½ in. by 1½ in. Flexible Plate and a 2½ in. by 1½ in. Flexible Plate.

Parts required

1 of No. 1	1 of No. 21	4 of No. 89b
1 of No. 1b	1 of No. 23a	1 of No. 94
2 of No. 2a	3 of No. 24	5 of No. 96
2 of No. 3	1 of No. 26b	1 of No. 96a
6 of No. 5	2 of No. 26c	2 of No. 103k
1 of No. 6	1 of No. 27	2 of No. 111a
5 of No. 8	2 of No. 27d	1 of No. 111c
9 of No. 8b	1 of No. 29	1 of No. 130a
8 of No. 9	166 of No. 37a	1 of No. 154a
6 of No. 9a	162 of No. 37b	1 of No. 154b
4 of No. 9b	60 of No. 38	2 of No. 179
2 of No. 9d	1 of No. 45	15 of No. 188
3 of No. 9f	1 of No. 48	7 of No. 189
4 of No. 12	1 of No. 48a	12 of No. 191
3 of No. 15	2 of No. 48c	2 of No. 192
3 of No. 15a	1 of No. 51	1 of No. 195
1 of No. 15b	1 of No. 52	1 of No. 197
3 of No. 16	12 of No. 59	2 pf No. 225
1 of No. 16b	4 of No. 63	1 Power Drive
3 of No. 17	2 of No. 70	Electric Motor

DINKY'S MONTE CAR



a very special little 'imp'

Dinky Toy News by Chris Jelley

REMEMBER the furore at the beginning of the year when the highly-placed British cars in this year's Monte Carlo Rally were disqualified because of the number of headlamps they carried? One of those cars, the unofficial winner of the Coup des Dames, awarded to the best ladies' team, was a Hillman Imp. It was not, however, the standard production model, but a modified version, specially designed for tough, long-distance rallying.

Meccano Ltd. have now produced a miniature replica of this special Imp which, from their point of view, is doubly important, as it emphasises their ability to keep up with world events. Why?—because the Dinky Hillman Imp Rally Car, without the slightest drop in quality, was decided upon, then rushed through production and distributed in time to coincide with the real-life Monte Carlo Rally. In all respects, the model was a 'special' and given top priority in every stage of manufacture, from drawing-board to despatch.

Before dealing with the model, it is interesting to first look at the original car. This, as already mentioned, is a modified version of the standard production vehicle, the main difference being in the power plant. Whereas the normal Imp carries an 875 c.c. rear-mounted engine, developing 42 b.h.p. at 5,000 r.p.m., the rally car has a 998 c.c. engine that produces 65 b.h.p. at 6,200 r.p.m. In terms of road performance, this results in raising the top speed by over 20 per cent, from 80 to 100 m.p.h., and allows effortless cruising at over 80 m.p.h. Pulling power and acceleration, too, are dramatically increased in every gear. For example, the 0-60 m.p.h. acceleration time is now 14·8 seconds compared with 23 seconds for the production car.

As you probably know, it can be dangerous to take a standard car and merely provide it with a much more powerful engine. The higher speed imposes increased suspension strains, besides making more efficient brakes advisable. Awake to the danger, Hillman have added servo-assistance to the braking system and have modified the suspension, by fitting stronger springs and heavy duty shock absorbers.

Turning, now, to the Dinky Rally Car, this really is an appealing little model. Marketed under Sales No. 214, it is equipped with all the usual Dinky Toy features, including an opening luggage compartment at the front and an opening engine compartment at the rear containing a minutely-detailed 'engine'. Also included are Prestomatic steering, four-wheel suspension, number plates and windows, plus full interior fittings—moulded seats, facia panel and steering wheel.

Special rally features incorporated are particularly interesting. These include amber-coloured jewelled headlamps at the front, augmented by a cluster of three plated spotlamps fixed just above the front air-intake and looking very effective. Mounted on both the bonnet and boot lid are distinctive red and white 'Rallye Monte-Carlo' identification plates which incorporate the competition number '35'. This number is repeated in large white figures on each door.

Overall finish is in a striking deep blue gloss with silver chassis and with a white flash running down each side from nose to tail. The front number plate, incidentally, is mounted, like most rally cars, on the bonnet instead of beneath the front bumper.

A few final words about the full-size rally car: Irrespective of its unofficial win at the 'Monte', it has in any case proved a brilliant success in the rallying field. Last season alone it was outright winner of the International Tulip Rally as well as netting the coveted Manufacturers' Team Prize in the R.A.C. International Rally. It also gained overall 'firsts' in the Canadian K.L.G. and Tanzanian Rallies besides chalking up class wins in many other international competitions. In short, it is a rally car with a past and a future!



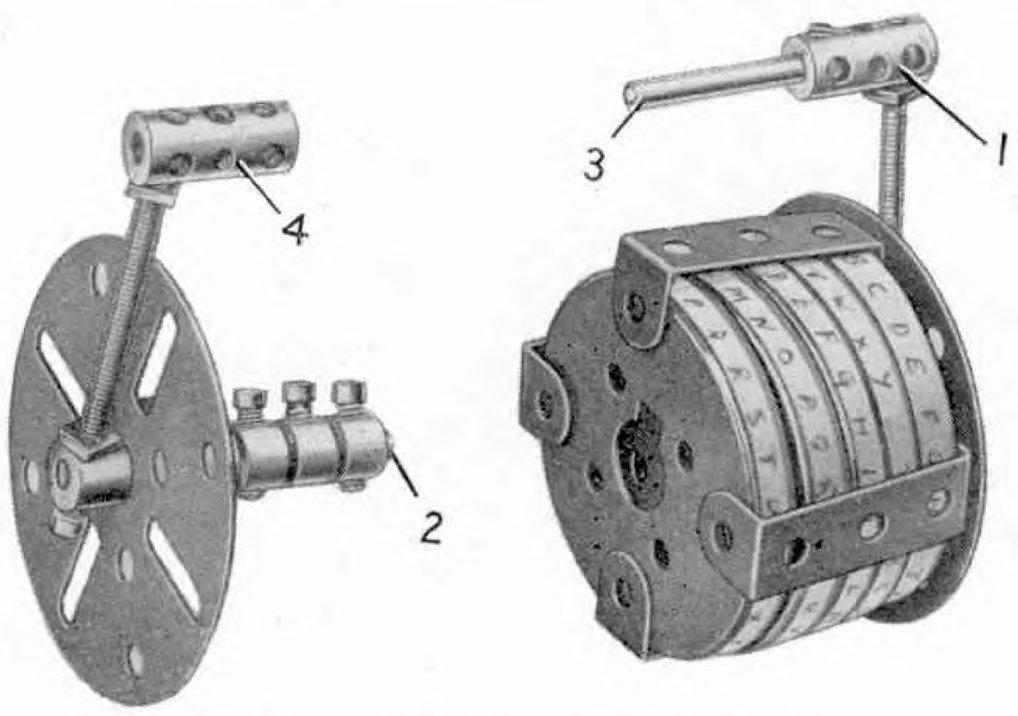
STOP PRESS!

Meccano Limited were the real pioneers of die-cast toys in Great Britain and they have recently been doing some serious forward-thinking. RESULT—Another complete breakthrough, not this time, in modelling itself, but in the whole field of toy manufacturers' literature. They have broken entirely from the idea of a traditional stereotyped catalogue and have come up with the revolutionary 1966 DINKY BOOK OF CARS.

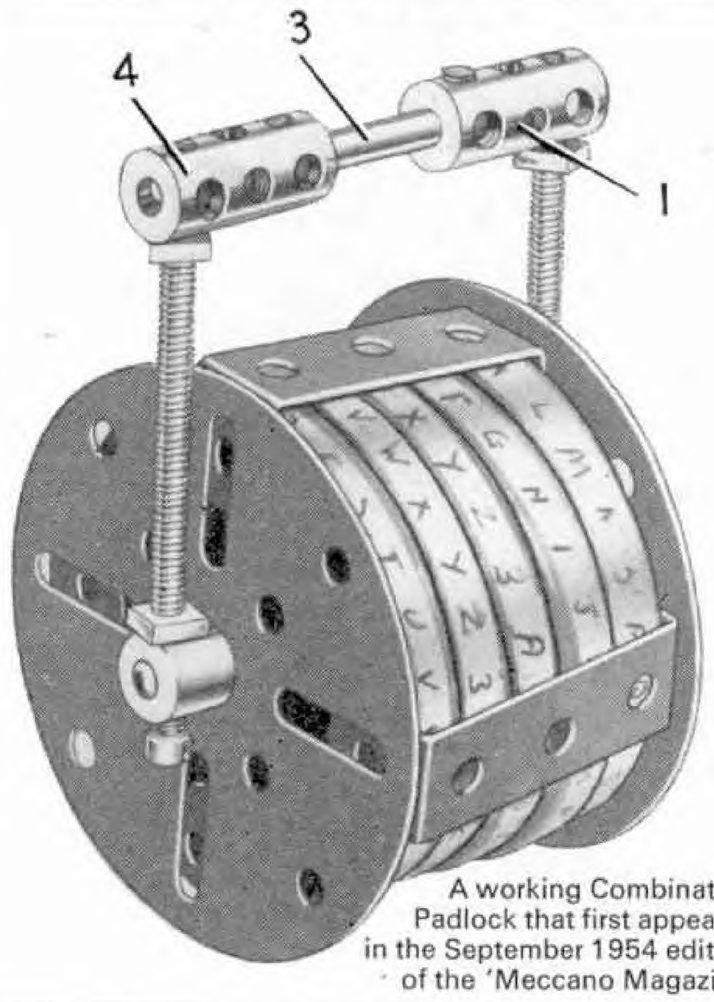
This publication, while serving the same purpose as a catalogue, is vastly superior. Containing more than a hundred full-colour pages, it qualifies as a pocket-book in its own right and should appeal to both the small boy and the serious collector alike.

In the main, a full page is devoted to each model in the Dinky Toy range and where possible, the relevant technical data concerning the real-life vehicle is given in addition to an illustration of the model and a little diagram showing the action features of the Dinky itself. Note, however, that the book is *not* obtainable from Meccano Ltd., but *only* from authorised Dinky Toys dealers, price 6d.

by Spanner



The Combination Padlock in an unlocked position



A working Combination Padlock that first appeared in the September 1954 edition of the 'Meccano Magazine'

Remember the Combination

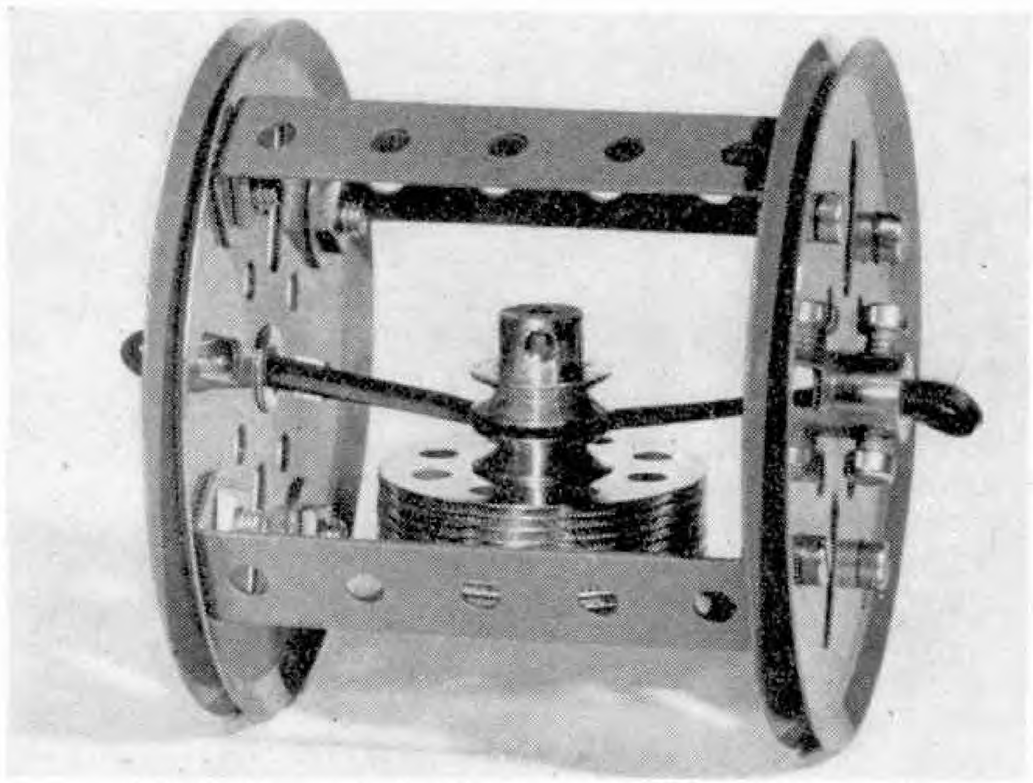
Parts required

Padlock

1 of No. 17
1 of No. 18a
12 of No. 37a
4 of No. 37b
4 of No. 48
5 of No. 59
2 of No. 63
5 of No. 69
2 of No. 81
2 of No. 109
5 of No. 137

'Boomerang'

1 of No. 18a
2 of No. 19b
1 of No. 23
1 of No. 23a
9 of No. 24a
8 of No. 37a
8 of No. 37b
4 of No. 48a
1 of No. 59
4 of No. 69
1 of No. 186a



A fascinating mechanical 'Boomerang' which quickly returns when rolled away on a flat surface

ALWAYS on the lookout for new models to describe in the 'M.M.', I sometimes forget that the magazine has been on sale for 50 years. During this time literally thousands of examples have been featured, the great majority of which have never been seen by today's readers, and we felt that, occasionally, you might like to have a shot at some of these past constructions.

The difficulty, of course, lies in picking the models to feature, a problem I overcame in this instance by browsing through old issues and choosing, to begin with, a couple of models that *I* thought fascinating—hope you agree.

Combination padlock

First in line is a padlock, working on a five-letter combination system, that appeared in the September 1954 'M.M.' Four 1½ in. by ½ in. Double Angle Strips, bolted in the elongated holes of a Face Plate, form a cage for five Wheel Flanges. The bolt heads are on the outside of the Face Plate, and a second Nut is threaded on each Bolt. Note that the Wheel Flanges are inserted by bending one of the Double Angle Strips outward, replacing it when they are in position.

A 2 in. Screwed Rod, carrying a Coupling 1 locked in position by a Nut, is fitted in the boss of the Face Plate. Strips of paper are gummed round the edges of the Wheel Flange, numerals or letters being marked at intervals on each Strip.

A 2 in. Rod 2 is fixed in the boss of another Face Plate. Five Collars, each carrying a Set Screw in one transversed tapped bore, are mounted on the Rod with a small space separating them, and are arranged so that the Set Screws fall into line. Another 2 in. Screwed Rod, carrying a second Coupling 4, is now mounted in the boss of this Face Plate while a 1½ in. Rod 3 is fixed in Coupling 1.

When the cut-away portions in the centre of the Wheel Flanges are in line, Rod 2 can be inserted, with Rod 3 also fitting into Coupling 4. As soon as the Flanges are turned, the Rod cannot be removed until the cut-away portions are again brought into line.

There and back

Taken from the August 1957 Magazine, model No. 2 will appeal particularly to very young builders. It's a novel mechanical 'boomerang' which, when rolled away on a flat surface, always comes rolling back.

Construction is simple. Four 2½ in. by ½ in. Double Angle Strips are bolted between two 3 in. Pulleys. A 6 in. Driving Band is then passed through the bosses of the Pulleys and held firmly in place by Bolts screwed into the transverse tapped bores. A ½ in. fixed Pulley, a ½ in. loose Pulley, nine Wheel Discs and a Collar are placed on a 1½ in. Rod, and the Driving Band is passed between the two Pulleys. The Collar and the fixed Pulley are now pressed together and fixed in position so that the Driving Band is held tightly in place. If required, the internal 'works' can be covered by bolting Plates to the Double Angle Strips.

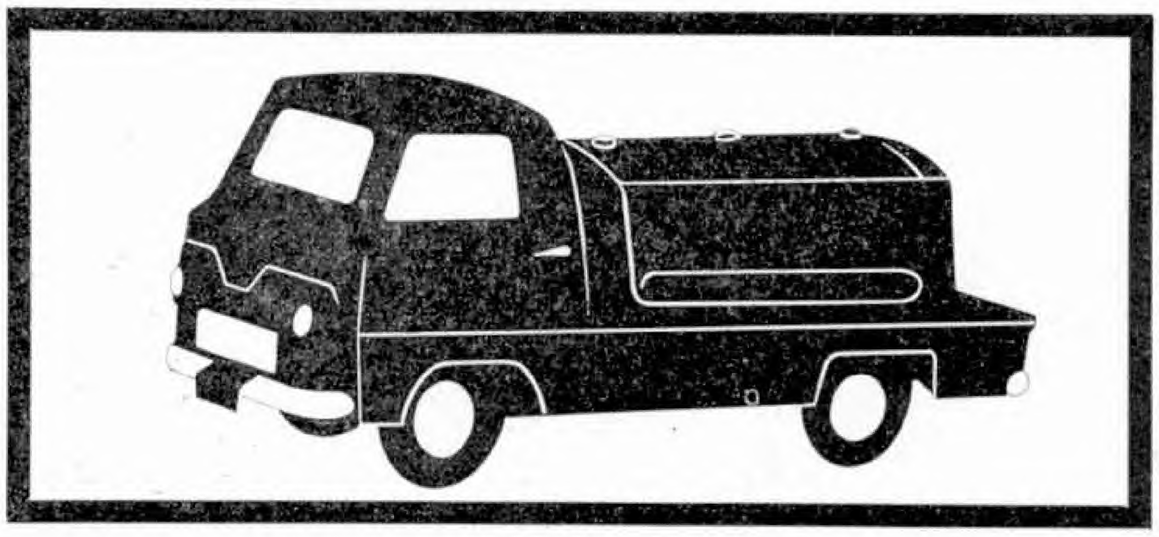
vehicle outline COMPETITION

50 Dinky Toy Models to be won!

Fill out the form and send it to us. The names of the senders of the first 50 correct answers will be published in the next issue of Meccano Magazine. The winners will then be expected to write to us to claim their prize. The competition will be judged by the Editor of Meccano Magazine. His decision will be final and no correspondence can be entered into.

FIVE MODELS will be reserved for OVERSEAS READERS. These will be selected one month after publication date.

To:—Meccano Magazine: Competition K, St. Alphage House, Fore Street, London, E.C.2.



The vehicle illustrated is:—

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NAME .....

ADDRESS .....

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DINKY TOY WINNERS

BELOW is a list of fifty names of readers whose entries for last month's 'Silhouette' competition were the first correct answers to be selected by the Editor. If your name appears in this list, then write on a postcard to: *Silhouette Prize, Meccano Magazine, Thomas Skinner & Co. Ltd., St. Alphage House, Fore Street, London, E.C.2,* and claim your FREE Dinky Model Airport Fire Tender. If your name does not appear in this list, even though you entered for the competition, don't be too disappointed—try again!

R. Andrews, High Street, Stalbridge, Dorset. *S. Bacon,* Essex Road, Manor Park, London, E.12. *P. Benn,* Haffotty Llechwedd, Gaer, Llanfianghel, GM, Corwen, N. Wales. *K. Booker,* Hill Top Close, Loughton, Essex. *J. Bowyer,* Cherry Way, Upper Halliford Road, Shepperton, Middx. *A. Collier,* Paget Street, Grangetown, Cardiff. *N. Daber,* Fir Trees, Barry Rise, Bowdon, Altrincham, Cheshire. *A. Davis,* Budshead Road, Whitleigh, Plymouth, Devon. *H. Davis,* Barrington Road, Loughton, Essex. *P. Edwards,* Heoc Powys. Birchgrove, Cardiff, S. Wales. *M. Endacott,* Middleton Avenue, Chingford, London, E.4. *P. Gardiner,* Bevin Road, Hayes, Middx. *R. Glover,* Southfields Close, Dorrington, Chichester, West Sussex. *P. Gregory,* Ravenscourt Park Mansions, Dalling Road, Hammersmith, W.6. *P. Griffin,* High Street, Nutfield, Redhill, Surrey. *R. Groom,* Tower Road West, St. Leonards-on-Sea, Sussex. *Gary Hames,* Moorland, Avenue, Barton-on-Sea, Hants. *E. Hewett,* High Street, Long Wittenham, Nr. Abingdon, Berks. *C. P. Higgins,* Hampden Hill, Ware, Herts. *S. Hubbard,* 11th Avenue, Windy Bank Estate, Hightown, Liversedge, Yorks. *Ian King,* Mount Pleasant, Wembley, Middx. *J. Lloyd,* Attimore Close, Welwyn Garden City, Herts. *A. Lockwood,* Middleton Drive, Pinner, Middx. *Richard Mansell* Mayfield, Beacon Close, Amesbury, Wilts. *I. Marwood,* Brynbowydd, Blaenau Ffestiniog, Merioneth, N. Wales. *T. Orton,* Bankside, Raglan Road, Reigate, Surrey. *D. Parsons,* Hall Lane, Upminster, Essex. *R. Pascall,* Wiverton House, Plympton, Devon. *M. Penny,* Seaton Road, Yeovil, Somerset. *M. Phillip,* Wimbledon Park Road, London, S.W.19. *P. Rippengale,* Rushdean Road, Strood, Kent. *D. Ritchie,* Fairmount Road, Barnhill, Perth, Scotland. *C. Rushton* Prospect Drive, Heast Bank, Lancaster, Lancs. *N. Rust,* Richards Avenue, Lincoln. *D. Smith,* St. Peters Hill, Caversham, Reading, Berks. *Peter Smith,* Osborne Road, Stockton-on-Tees, Co. Durham. *P. M. Smith,* Kirkstone, Beckenham Place Park, Beckenham, Kent. *R. Tibbitt,* Oak Tree Close, Virginia Water, Surrey. *I. Ward,* Chestnut Drive, South Pennington, Leigh, Lancs. *D. Watting,* Castlewood Drive, Eltham, London, S.E.9. *M. Weedon,* Denziloe Avenue, Hillingdon, Middx. *I Wilson,* Parkway, Weston Favell, Northampton. *I. Wright,* Acre Blundel Lane, Stoke Dabernon, Cobham, Surrey. *Derek Vincent,* High Road, Chadwell Heath, Romford, Essex.

Overseas Winners Competition 'I'

Kenneth Taylor, Marett Court, Marett Road, St. Helier, Jersey, C.I. *Bryan Foster,* Molkomsbacken 45, Farsta, Sweden. *J. Hellwig.* Kim Street, Sarnia, Ontario, Canada. *Maher Aziz el Masri,* Street No. 1 Smouha, Alexandria, Egypt. *Versailles Jacques,* Rue Ave Beurre, Ypres, Belgium.

Answers to this month's puzzles

Quick Quiz

1. £53,000. The Darin-Di Dia 150, built in Detroit.
2. Sir Francis Drake, Plymouth.
3. 19 feet.
4. 1890.
5. Eleven triangles.
6. 72 years (Tower Bridge, London).

Tricky Teasers

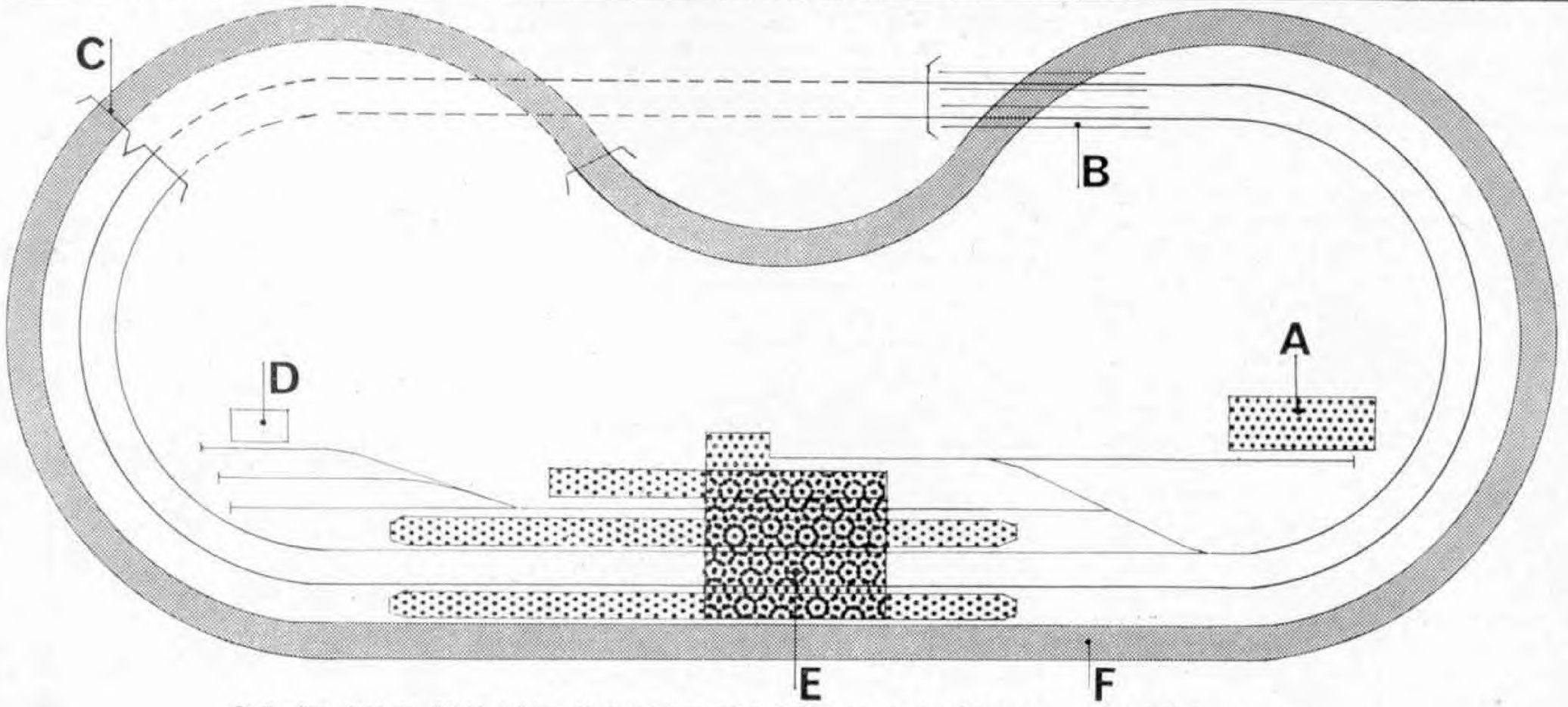
A The men weigh 14 stone, 12 stone and 10 stone.
B WIND— WAND— RAND— RAID— RAIN.
C Four and eight.
D All is not gold that glitters.

Crossword Puzzle No. 14

■	■	C	E	L	E	B	R	A	T	I	O	N	S
S	■	O	■	O	■	I	■	C	■	O	■	■	A
U	N	W	O	U	N	D	■	C	A	N	T	A	T
P	■	S	■	D	■	D	■	O	■	A	■	C	■
E	E	L	S	■	M	I	N	U	S	■	L	O	O
R	■	I	■	S	■	N	■	N	■	T	■	R	■
N	A	P	P	I	N	G	■	T	R	A	I	N	E
A	■	■	■	S	■	■	■	■	■	B	■	■	■
T	R	A	V	A	I	L	■	B	O	L	I	V	I
U	■	R	■	L	■	O	■	E	■	E	■	A	■
R	O	O	M	■	H	O	W	L	S	■	■	C	O
A	■	S	■	B	■	M	■	A	■	L	■	A	■
L	E	A	D	E	R	S	■	T	H	I	S	T	L
■	E	■	■	E	■	■	■	E	■	R	■	E	■
■	N	E	W	F	O	U	N	D	L	A	N	D	■

The left-hand side of the large railway/roadway layout with the Tri-ang Hornby Hymek locomotive in the foreground

LOCOMOTIVES AND A LAYOUT



A Engine shed. **B** Girder bridge. **C** Tunnel mouths. **D** Goods shed. **E** Station canopy. **F** Minic motorway

THE Tri-ang Toy Fair, held in Haymarket, London, every year, is the first opportunity that many dealers have of examining for themselves the many new products that are to appear during the coming year. It is also an excellent occasion to discover any changes that have occurred to existing items.

This year, the highlights of the exhibits in the Rovex Scale Models room were undoubtedly the four new locomotives planned to appear during the coming year, two of them have been mentioned in a previous Meccano Magazine. Of the four new locomotives in the Tri-ang Hornby range, two will be on sale very shortly, the R751 Co-Co 'English Electric' type 3, was actually included in the 1965 catalogue, although the illustration did not really do the locomotive justice. The model at the show deservedly captured the admiration of everyone who saw it. It is well up to the standard set by the AIA-AIA Brush type 2 locomotive, and the model has that characteristic 'bull nose' appearance so very typical of 'English Electric' engines. Also due to be released in the near future, is the 'English Electric' Bo-Bo locomotive, fitted with working pantographs, and which will collect current from the track in the normal way, or alternatively, from a pantograph system. A switch on the roof of the locomotive selects the method of current collection.

Although the two other new locomotives will not be available just yet, samples were on display for inspection. The 'Hall', which is very nicely detailed, will be the most eagerly awaited among enthusiasts and is complete with copper capped chimney to give that 'Swindon' flavour. The second locomotive, a Hymek Bo-Bo diesel hydraulic, also a Western Region locomotive, was on show resplendent with white window surrounds and pleasing green livery, making the selection of 'modern image' locomotives available in the Tri-ang Hornby range even more representative.

Railways and Roadways

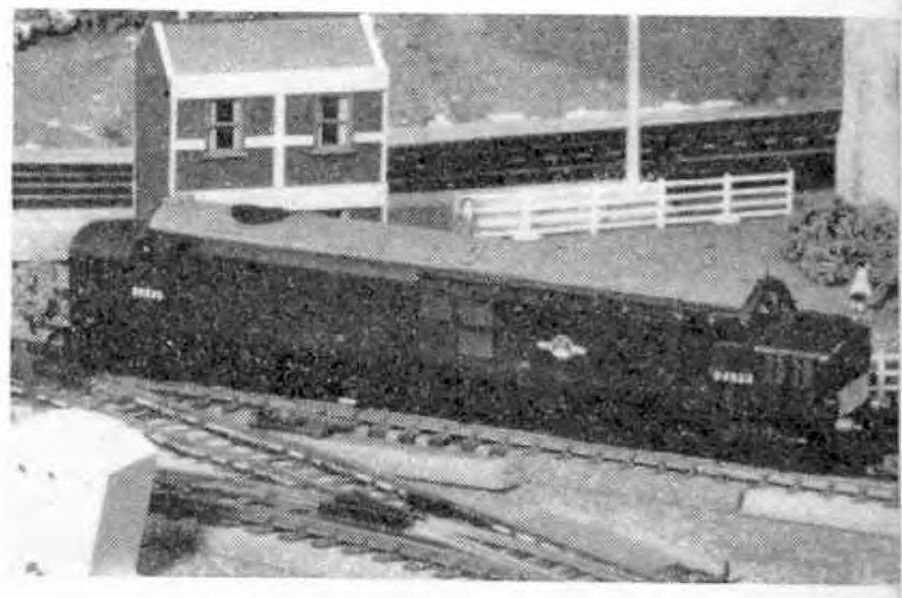
Altogether, there were *seven* layouts on show, ranging from one large railway/roadway layout, to a small Minic Motorway rally scheme. I thought the most fascinating of these, was the large railway/roadway layout which was also, I believe, shown at the Hamley's stand at the Schoolboy's and Girl's Exhibition. It measured approximately 10 ft. by 5 ft., and had a double track oval main line with a fairly comprehensive station at the front and a scenic backdrop behind. This consisted of a hill rising to the back of the layout with the track tunnelling through a double girder bridge on the right-hand side. A gradient at both ends of the layout was formed to lift the track clear of the motorway system at the back of the layout, and to allow it to pass under the girder bridge. The Minic Motorway system rather cleverly weaved its way round the back of the layout, disappearing into a tunnel on the left and at a lower level than the railway, re-appearing half way along the hill to run alongside the station before passing under the girder bridges. The scene as a whole was most effective, and was undoubtedly enhanced by the hill, which had been carefully built from King Size Colourings, cork bark, and lichen laid on a suitable framework and base, and of course with a tunnel mouth at each end and at the middle for the roadway.

Behind the layout was a backscene painted a plain blue but with a few white clouds added. Although quite simple, this effectively gave a finishing touch to the back of the layout which can often be the most difficult to model realistically. A backscene does, in addition, restrict the viewpoint to only one side of the layout. This makes the work of building scenery much easier than for those layouts viewed from all sides.

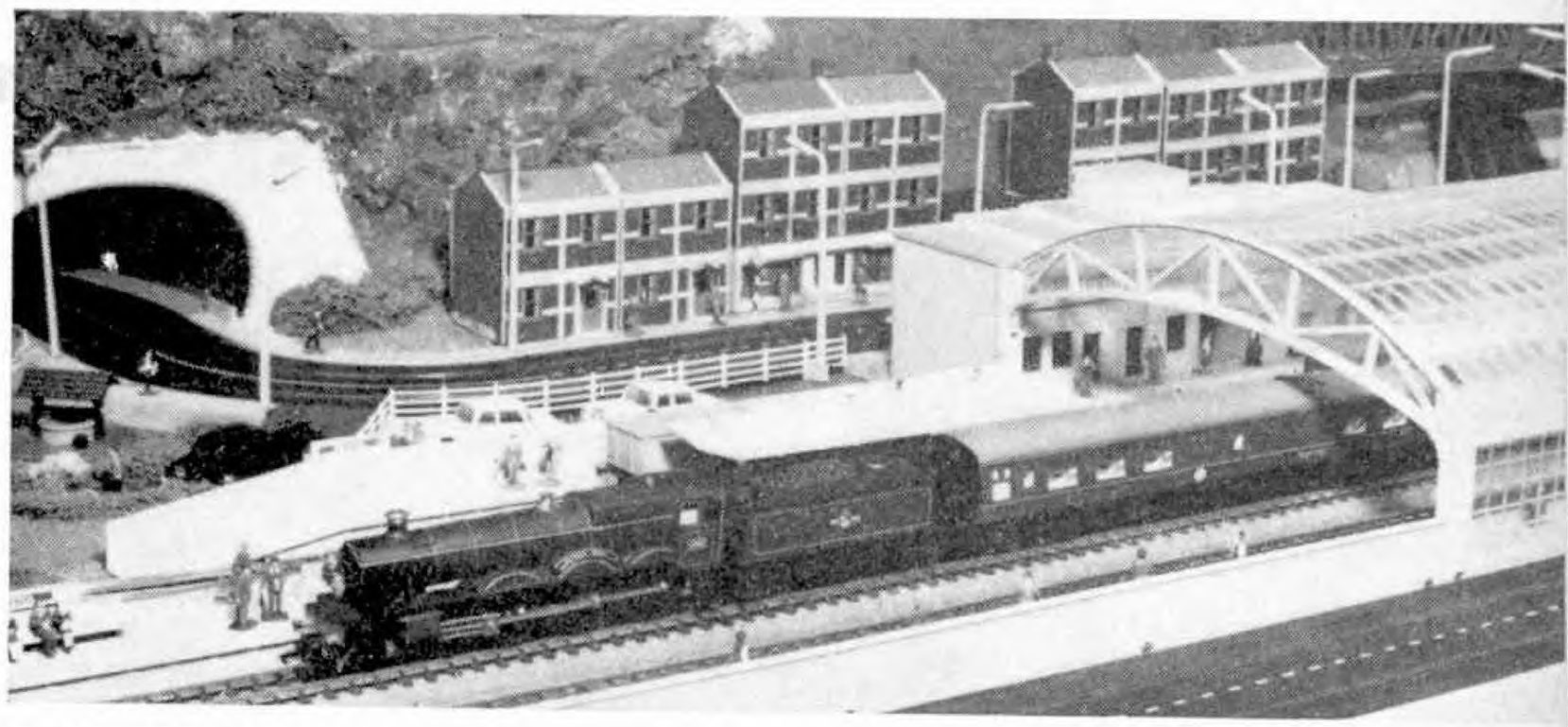
The station itself contained four platforms facing a two-siding goods yard, and a two-road engine shed. Two platform faces were formed from an island platform, one side of which was a terminal road. The canopy over the station, the goods shed, and the station buildings are formed from accessories formerly in the Hornby-Dublo range, and the layout is a good example of how these items blend with standard Tri-ang Hornby components. Behind the station is a row of houses built from kits in the Model Land series, two of which were described in the December issue. All are quite new products and are ideal for creating typical town street scenes.

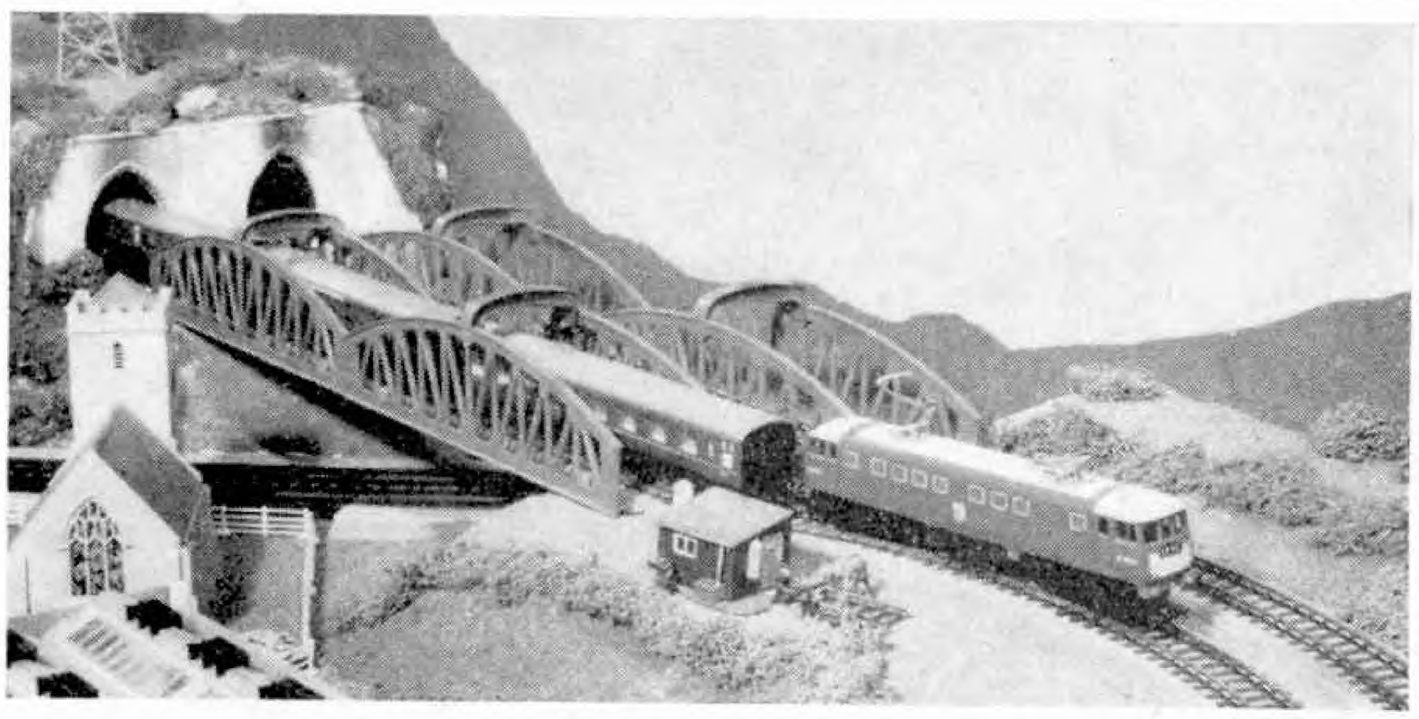
All track on the layout was ballasted with the grey foam plastic which is bought in strips 16 ft. 6 in. long. This is by far the best way of laying track, especially when the sleepers are pressed down until only the tops are visible. It gives a very realistic ballast appearance as you can see from the photographs, and in addition gives smooth silent operation, completely free from that annoying drumming noise that can be heard when track is laid without any form of underlay.

Mike Rickett



Right: in this picture can be seen the new 'English Electric' type 3 locomotive running from the locomotive shed to the station
Below: the Tri-ang Hornby 'Hall' waits patiently at platform 2
Bottom: over the double girder bridge is an express train pulled by the new pantograph locomotive





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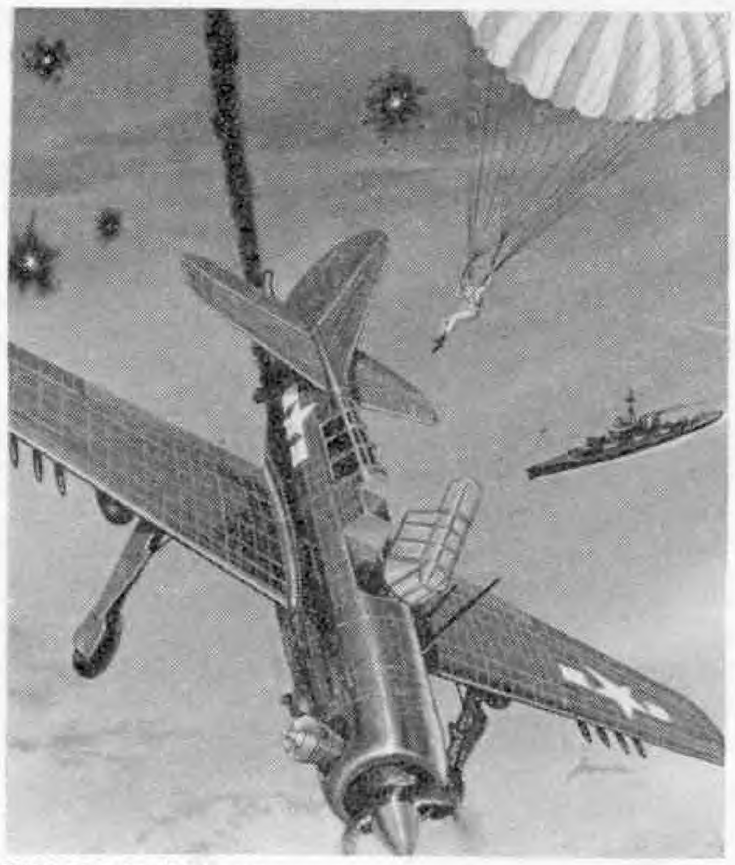
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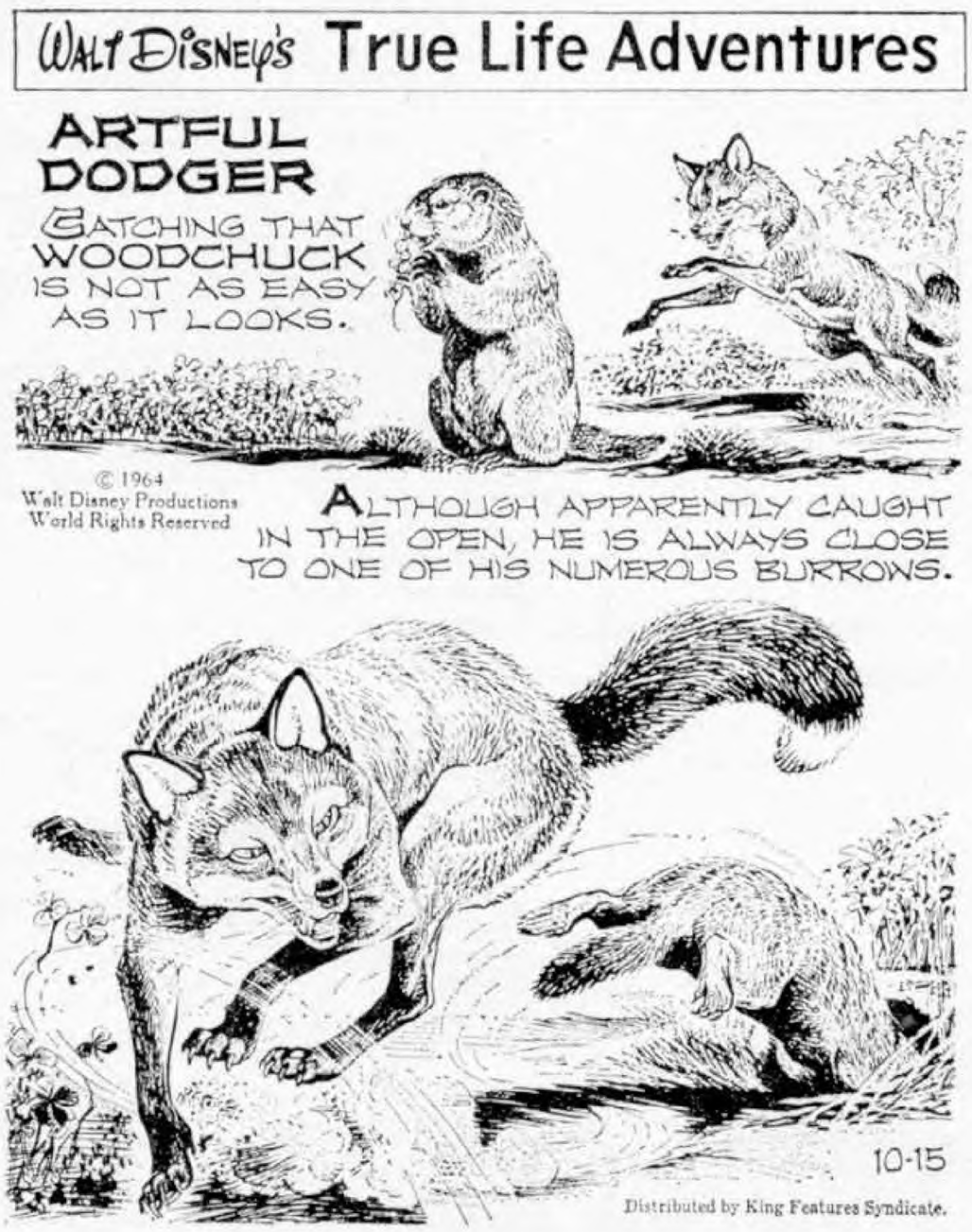
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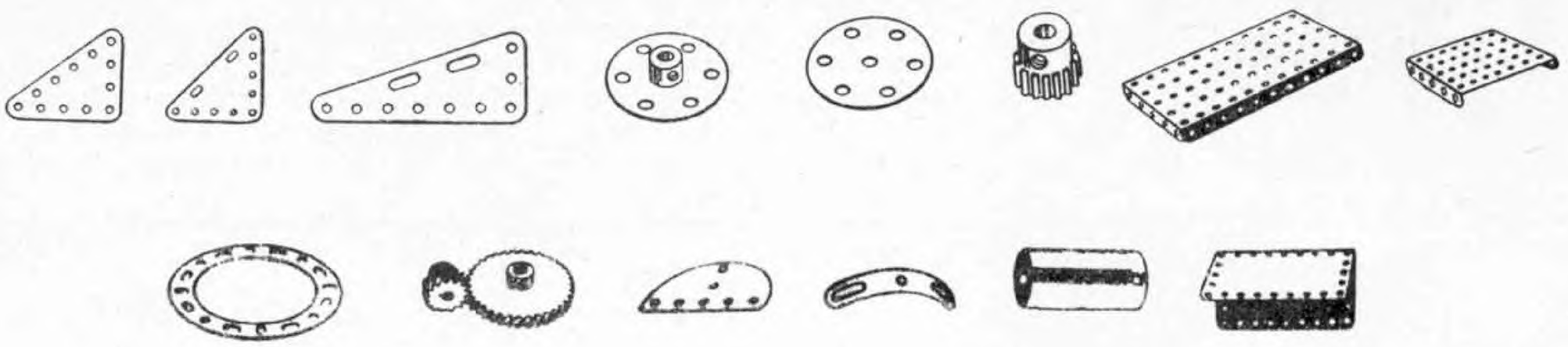
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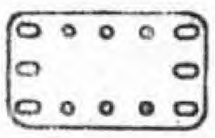
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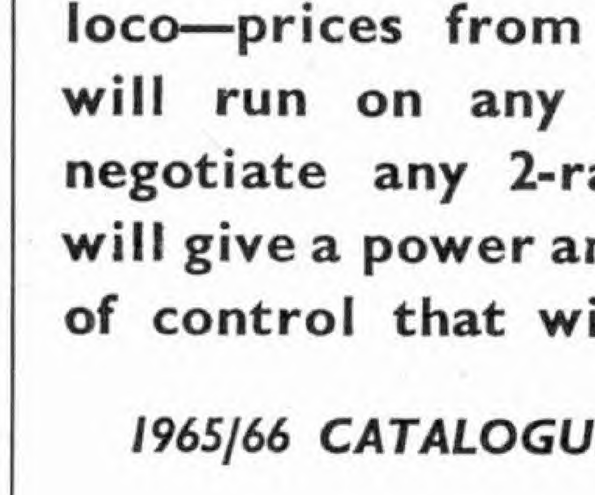
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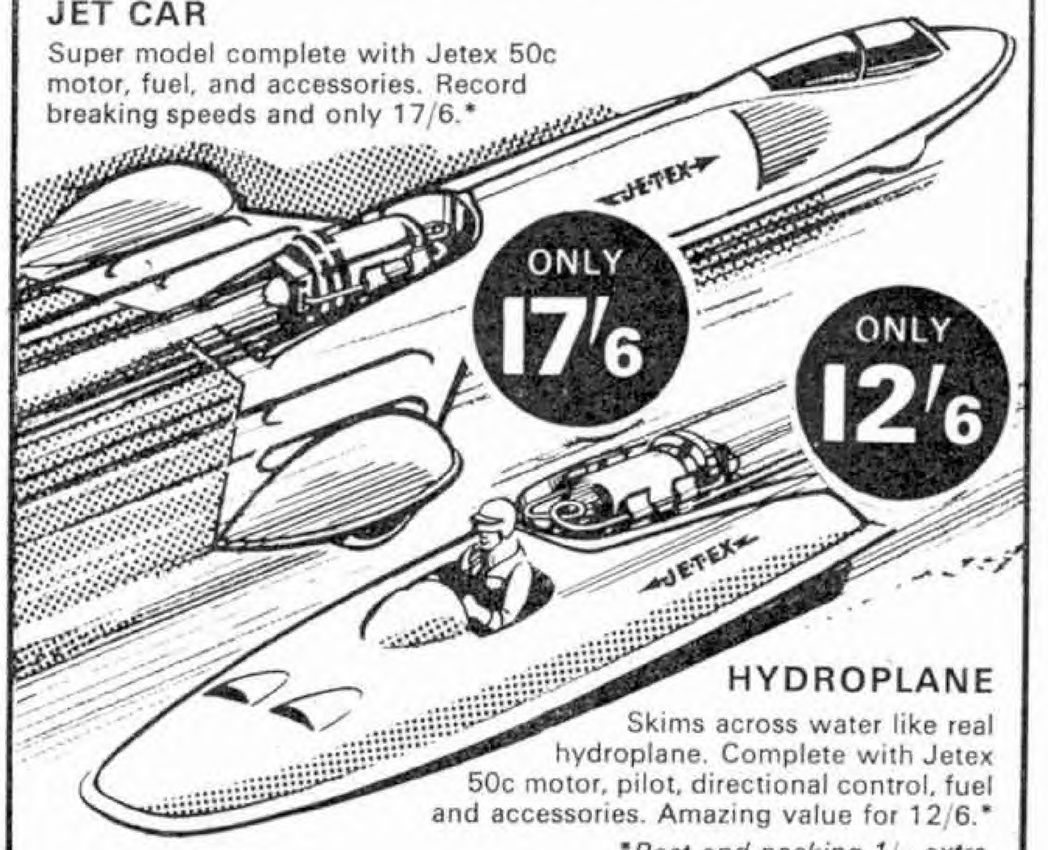
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STAMPS PAGE

by F.E.Metcalfe

Thematics

Amongst the subjects which are very popular with collectors are animals and, of course, (particularly so in Great Britain), dogs; for as a foreign friend said to me recently, we are crazy about them. This being the case, as it undoubtedly is, a stamp which depicts a real sad little doggy is being issued to commemorate the 120th anniversary of the Vienna Society for the protection of animals. I think I have never seen a more delightful drawing of a dog. I wish Austria would loan us a few of their artists—even one—to get to work designing some of our own stamps. How I would like to mount the results in the G.B. section of my collection, if they were anything like the stamp illustrated.

Alouette II

Whatever does that mean? Just the name of the Canadian satellite, which was launched in California, as part of the Canadian-American programme of space research, and to mark this important event Canada issued on January 5th a stamp, as illustrated. Now the stamp, of a dark blue colour, is a beauty, and I could not resist mentioning it, but I am afraid that my knowledge of what satellites are all about could be more extensive, so for those who wish to describe the stamp. in their thematic albums, I will have to content myself by quoting the official handout. 'The main purposes of the satellite are to measure the hour to hour electron densities at the height of the satellite; to listen to the very low frequency noise in the range of 1 to 10 kc/s and to measure primary cosmic ray particles outside the earth's atmosphere, including electrons, protons and alpha particles'. And if you understand just one single word of all that, and I'll bet some of you do, you can go over me in the class. I'll stick to stamps.

Jamborees

I think these are more my line of country than satellites, and I understood what the New Zealand Post Office was getting at when again on January 5th a stamp was issued to mark the 4th National Scout Jamboree. But this time it was the design of the stamp itself which I did not understand. What do you make of it? It was only an enlarged illustration which I saw to start off with, yet the actual stamp itself didn't look too bad at all, printed as it was in dark green and gold, but if you want to know the meaning of all those diamonds, I must again call on the official explanation. They are, they say, illustrating the traditional tuku tuku panel known as the potama. I wonder if some kind New Zealand reader will explain the design in English. I am very fond of the stamps of the country in question, and I know other M.M. readers are also very keen about them, but this Jamboree stamp certainly strikes a strange note.

Arabian Sheikdoms

Although I mentioned these new stamp-issuing countries fairly recently, I am still being asked for more details about the many stamps they are emitting, and if they are worth collecting? Let me answer the latter query right away, by saying, that the stamps would be more popular, and thus worth more in the long run, if they would curb their present attitude to bring out new sets, under the slightest pretext. For instance, one of these states on January 17th, released nine stamps to mark the Stamp Centenary Exhibition in Cairo. The designs were attractive enough, but they had no more connection with Fujeira than had the centenary itself. Yet, as can be seen by the illustration of one of them, they certainly know how to produce stamps with eye, if not pocket appeal.

A wide variety of subject matter is evident in these four stamps which are described on this page.







Orchids

A collector who had been collecting stamps depicting flowers, told me recently that, in the first place, he had had to give up collecting 'bird' stamps because there were too many, and after going floral, as he put it, he has now had to limit his field to orchids, and he has been surprised how many there are of the latter. Well, he will find plenty of orchid stamps amongst the South and Central American issues, and recently the 13 states which make up Malaysia, each issued seven stamps, with seven different orchids as their motif, so to get all those used (mint will be quite easy, and all are of low face value, so just over a pound will buy the lot) will be quite a task. But not an impossible one, for most of the stamps are used fairly freely. I think I will have a go at an orchid collection myself.

The tip of the month

Perhaps I should not mention them again, but as I know that the stamps recently issued by Australia, its Dependencies, as well as the overprint issued of British Solomon Is. and Gilbert and Ellice Is., have such great possibilities, I do think if you are at all interested in stamps from down under, you should make all efforts to get these first printings, in the decimal currency (the reason for the change) as soon as you can. The ones to go after first are obviously the surcharged stamps, as they will only have lives of a few months; they being merely pro tem issues, pending the preparation of new issue, in the new currency. Good hunting. Some fine kills will result in the long run.

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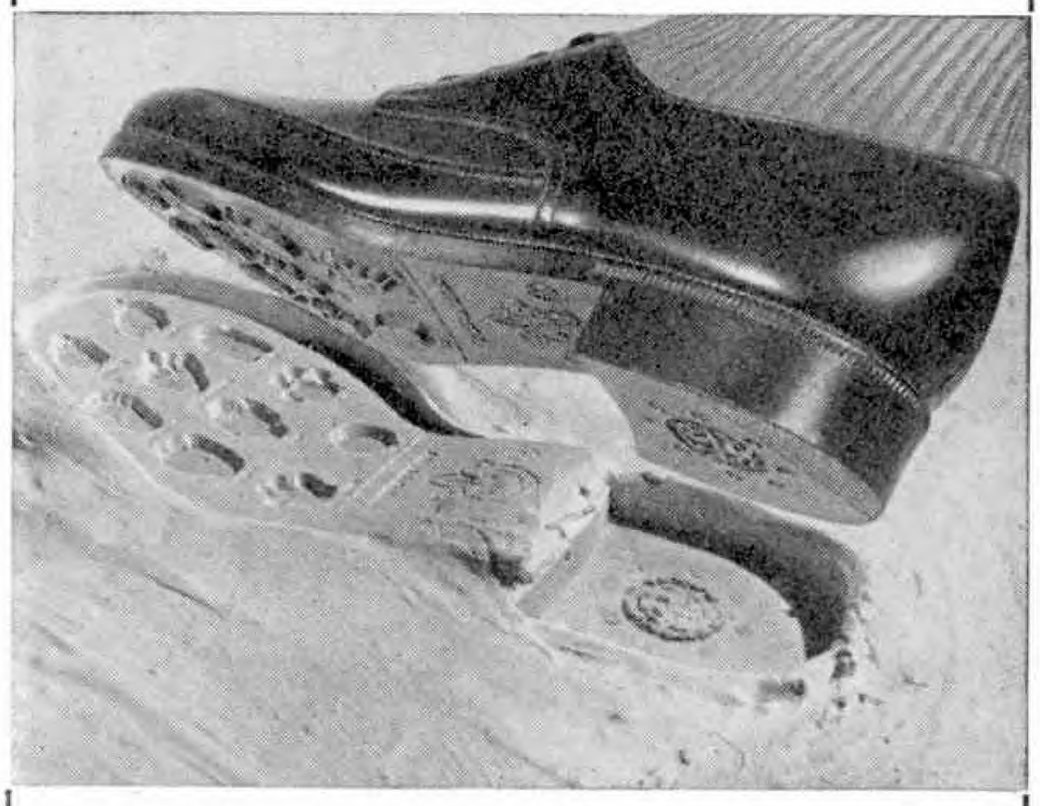


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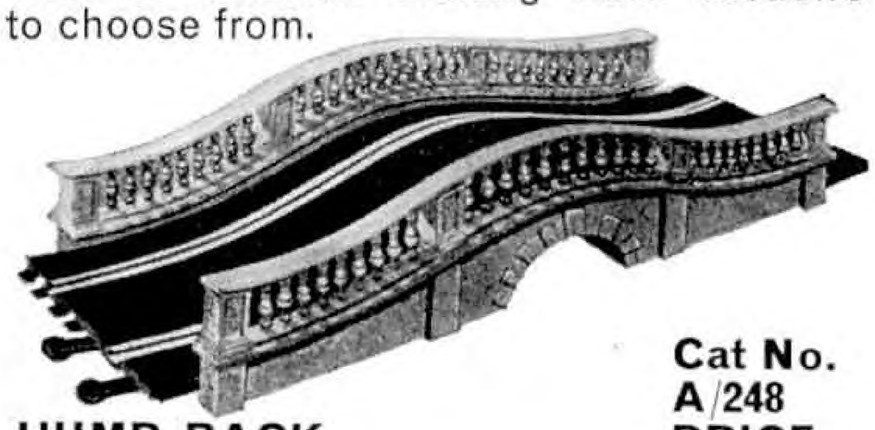
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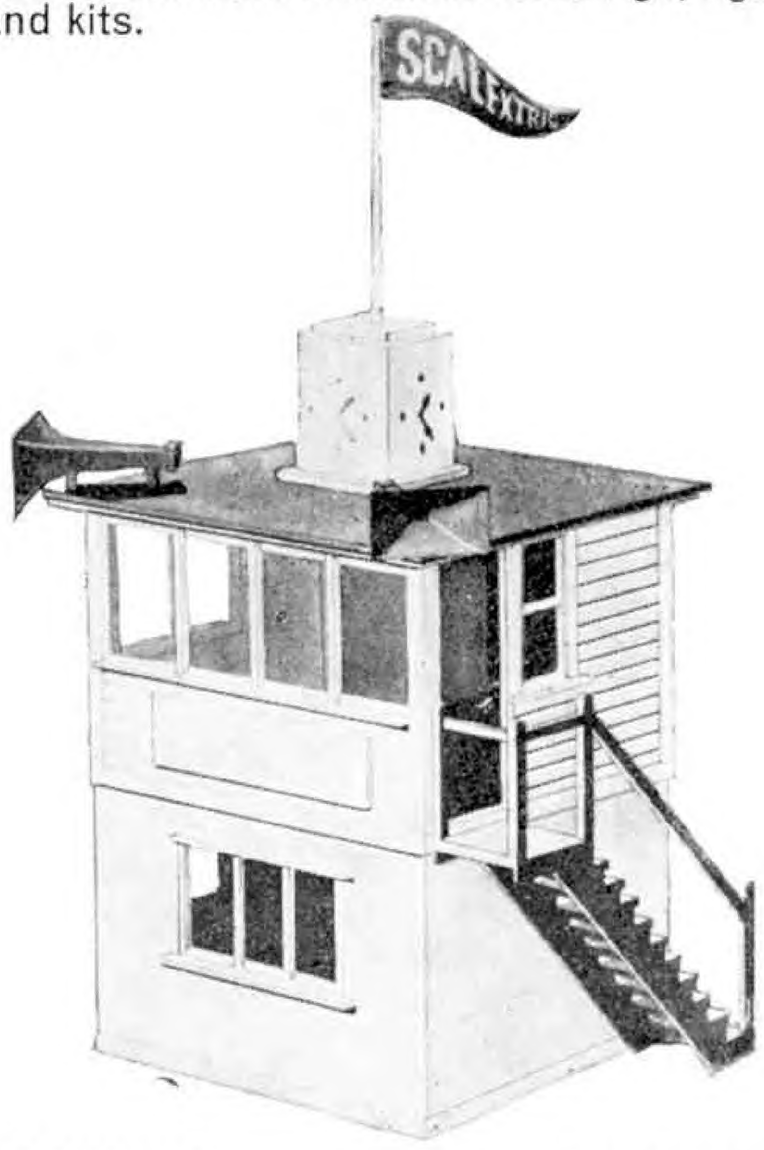
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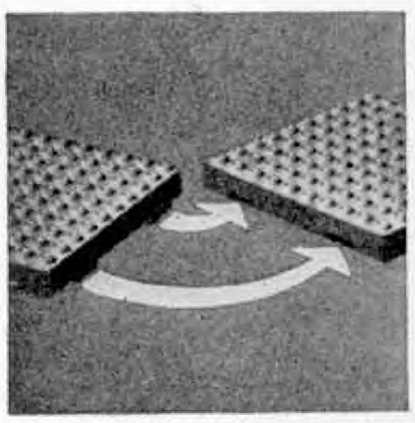
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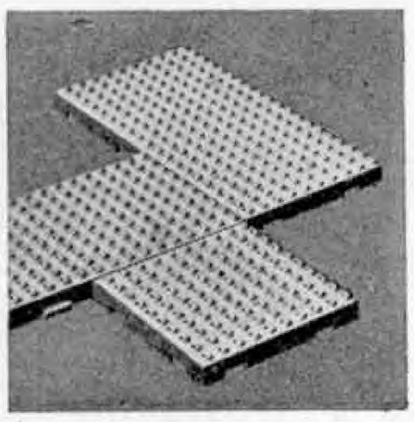
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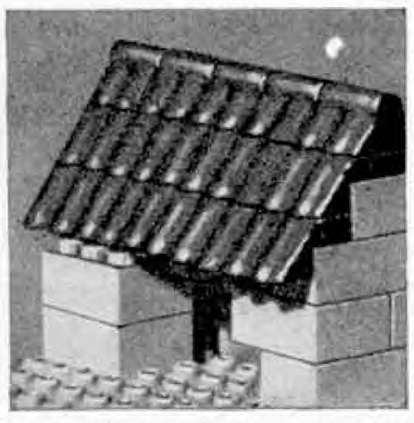
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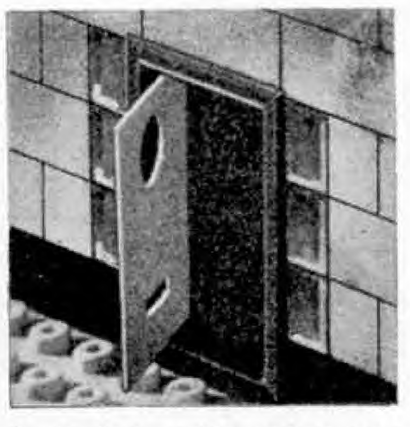




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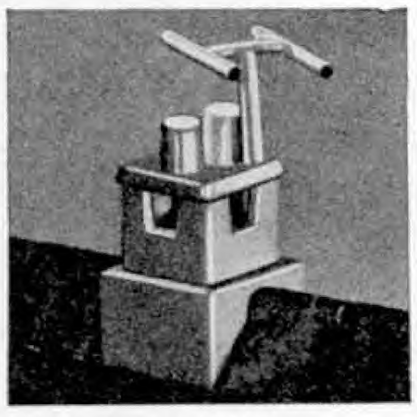
windows that open and shut



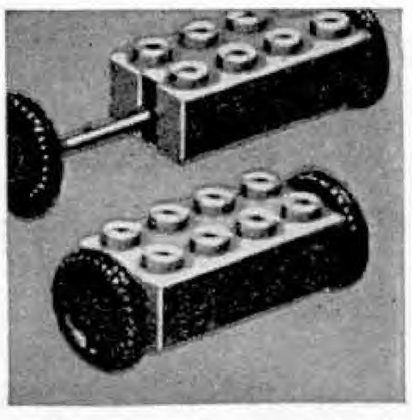
doors that are hinged to open and close



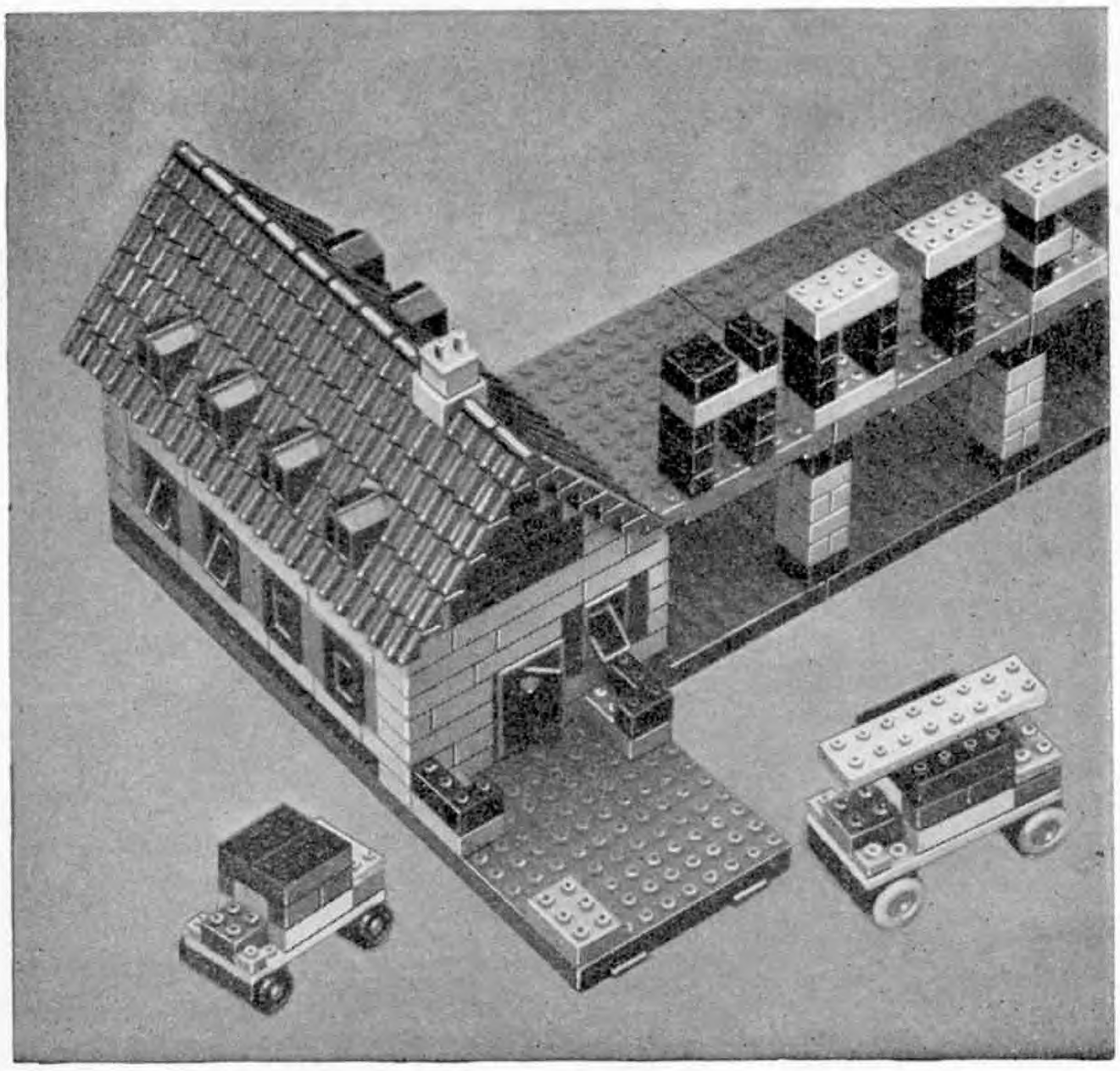
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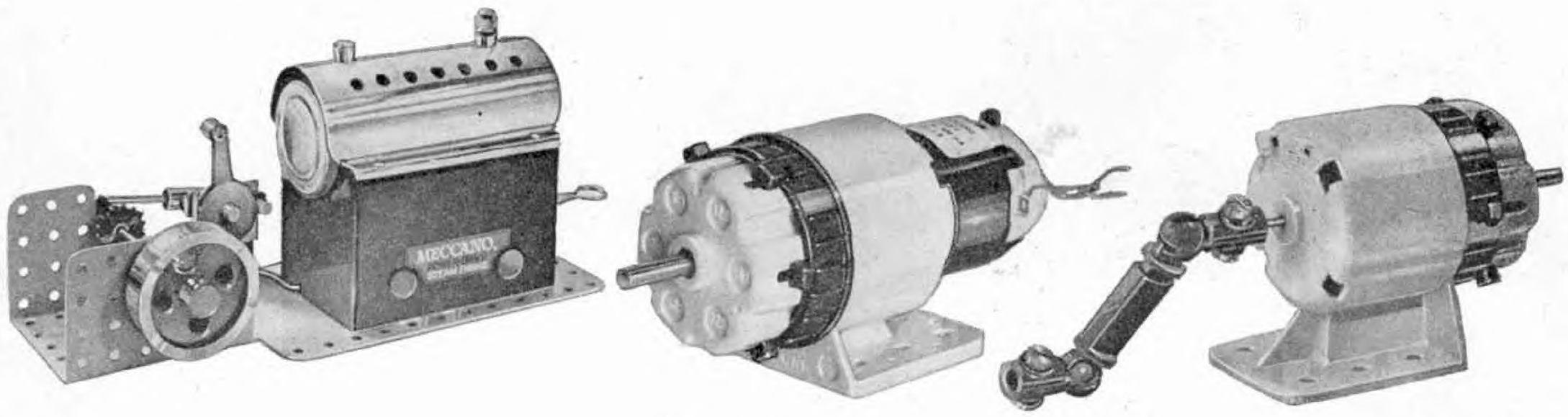
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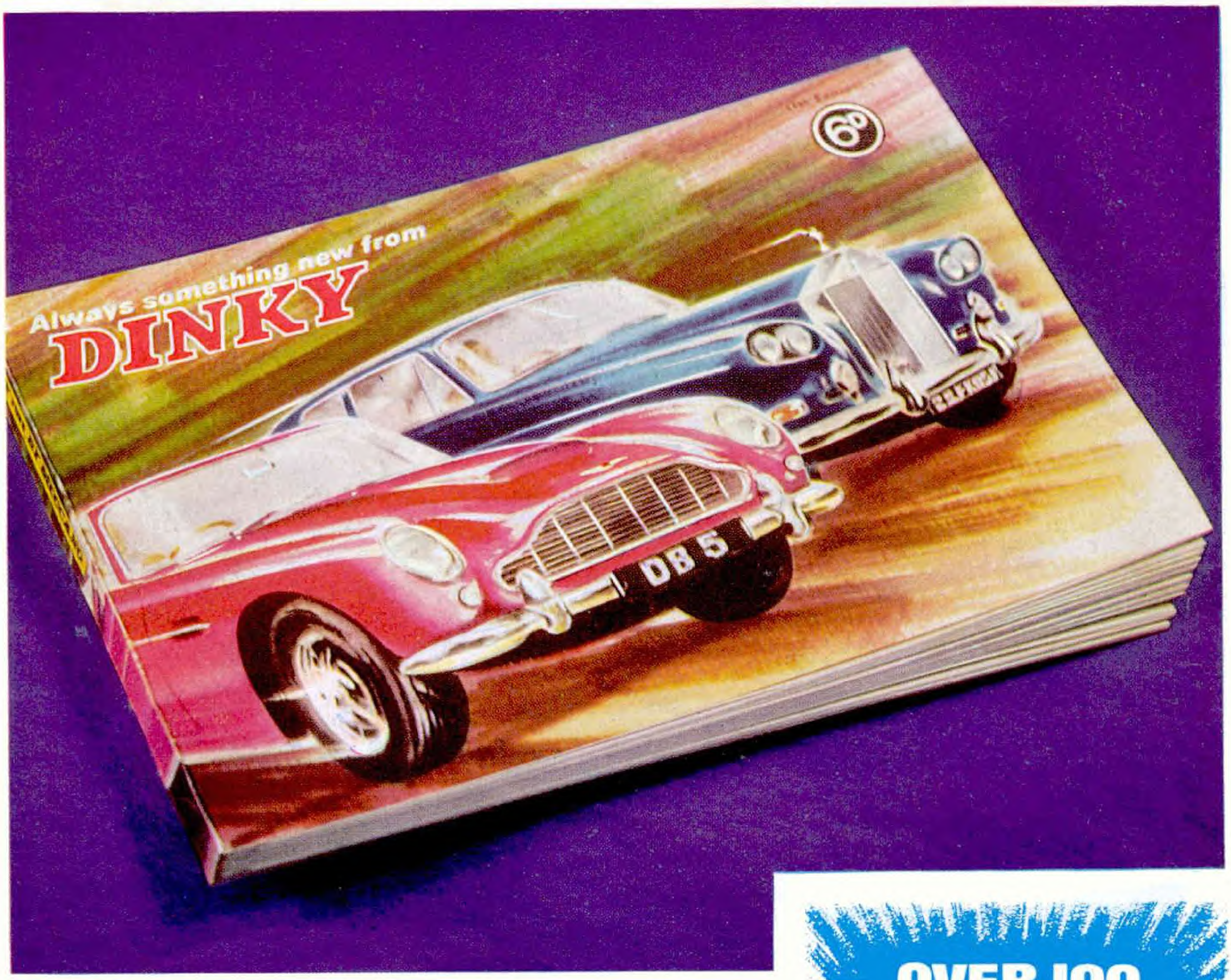
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